An Architectural Response to Multi-Generational Housing Inspired by Haudenosaunee Culture

by

Haley Schumacher

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Architecture (M.Arch)

The Faculty of Graduate Studies
Laurentian University
Sudbury, Ontario, Canada

THESIS DEFENCE COMMITTEE/COMITÉ DE SOUTENANCE DE THÈSE
Laurentian Université/Université Laurentienne
Faculty of Graduate Studies/Faculté des études supérieures

Title of Thesis Titre de la thèse	An Architectural Response to Multi-Generational Housing Inspired by Haudenosaunee Culture
Name of Candidate Nom du candidat	Schumacher, Haley
Degree Diplôme	Master of
Department/Program Département/Programme	Architecture
Date of Defence Date de la soutenance	April 09, 2019

APPROVED/APPROUVÉ

Thesis Examiners/Examinateurs de thèse:

Eladia Smoke
(Thesis Advisor / Directeur(trice) de thèse)

Harriet Burdett-Moulton
(Thesis Second Reader / Directeur(trice) de thèse deuxième)

Professor Brian Lilley
(External Examiner/Examinateur(trice) externe)

Approved for the Faculty of Graduate Studies
Approuvé pour la Faculté des études supérieures
Dr. David Lesbarrères
Monsieur David Lesbarrères
Dean, Faculty of Graduate Studies
Doyen, Faculté des études supérieures

ACCESSIBILITY CLAUSE AND PERMISSION TO USE

I, **Haley Schumacher**, hereby grant to Laurentian University and/or its agents the non-exclusive license to archive and make accessible my thesis, dissertation, or project report in whole or in part in all forms of media, now or for the duration of my copyright ownership. I retain all other ownership rights to the copyright of the thesis, dissertation or project report. I also reserve the right to use in future works (such as articles or books) all or part of this thesis, dissertation, or project report. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by the professor or professors who supervised my thesis work or, in their absence, by the Head of the Department in which my thesis work was done. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that this copy is being made available in this form by the authority of the copyright owner solely for the purpose of private study and research and may not be copied or reproduced except as permitted by the copyright laws without written authority from the copyright owner.

Abstract

Indigenous culture is rich and vibrant all across Mother Earth; more commonly known as North America, and sadly is rarely reflected in the built environment of their communities. This thesis seeks to answer the question: How can the culture of the Haudenosaunee be reflected within their built environment to align with the needs of the community? Through the exploration of community engagement and case studies it was proven designs in Indigenous communities should be inspired by the culture's history and traditions while reflecting the community within the 21st century. Concepts, meanings, and teachings from Indigenous culture have the ability to influence a 21st century building. Through the exploration of wampum belts, Haudenosaunee longhouse, and longhouse village, a proposed multi-generational housing project demonstrates how the Haudenosaunee culture can in fact be reflected within the built environment to align with the needs of the community.

Keywords

Multi-generational housing, community design, Indigenous design, wampum belts, longhouse village, architecture, Haudenosaunee, Six Nations, Six Nations of the Grand River

Acknowledgments

Thesis Advisor	Eladia Smoke
Second Reader	Harriet Burdett-Moulton

I am grateful for my thesis advisor, Eladia Smoke for the support and guidance throughout the duration of the project from the process of researching to designing. Miigwech, nai:wen, thank you for the constant challenge of what this research and design meant to me as a designer. A special miigwech, nai:wen, thank you to my second reader, Harriet Burdett-Moulton for investing the time into sharing your experience with community engagement and for offering advice and guidance through the development of the design. Miigwech, nai:wen, thank you to Indigenous Student Centre staff: Bobby Aubin, Cynthia Belfitt, Gail Charbonneau, Rena Daviau, and Elder Juliette Denis for being an amazing support team for the past six years. I am grateful for the McEwen School of Architecture professors, charter class, and friends I have met along this journey, miigwech, nai:wen, thank you for the constant suggestions, support, encouragement, memories, and friendships created. Lastly, a very special miigwech, nai:wen to my family, particularly to my parents for their unconditional love and support, for always challenging me to do my best, for raising me to be strong and to never give up on something I believe in.

Table of Contents

List of Figures

Part 1: Research

Chapter 1

1 Introduction

Indigenous culture is rich and vibrant all across North America, and sadly is rarely reflected in the built environment of their communities. With only a small portion of registered Indigenous architects it is evident that most buildings in Indigenous communities are designed by non-Indigenous architects. With influences of time and cost, it is assumed many projects may not fully engage, or understand, the community before designing, resulting in Indigenous built environments not reflecting their culture. Douglas Cardinal stated, *"Architects have a responsibility to ensure that their architectural statements truly reflect the culture of each community. It is through the bringing together of different architectural voices…colonial nations acknowledge that it is no longer acceptable for design to be done without [Indigenous People]..."*[1] My research question is how can the culture of the Haudenosaunee be reflected within their built environment to align with the needs of the community? Through analyzing community engagement, case studies, wampum belts, and the Haudenosaunee longhouse, I can begin to understand how the built environment can reflect the Haudenosaunee people.

Community engagement and techniques to engage a community in the design process creates value by having the opportunity to learn about a community. Due to limitations, community engagement has inspired this thesis to explore the community's history, traditions, and culture.

Case studies completed by Haudenosaunee architects, Brian Porter, principal architect of Two Row Architect and Chris Cornelius, principal architect of studio:indigenous, both demonstrate successful projects inspired by Indigenous precedents to influence building design within the 21st century, without simply recreating their inspiration. These case studies influence how wampum belts, the Haudenosaunee longhouse, and longhouse village can translate into design.

The Haudenosaunee history was documented through the use of wampum belts. The beaded belts record an event through symbolism. By understanding the significance of the belts, they can be incorporated into the design as a quest for peace, alliance, and friendship among people.

1 Rebecca Kiddle, Luugigyoo Patrick Stewart, and Kevin O'Brien, *Our Voices: Indigeneity and Architecture*. (Novato, CA: ORO Editions, 2018), 96

The design of spaces both in plan and section can be inspired not only by the meaning of the belt but also from the geometry used.

The Haudenosaunee traditionally lived in a longhouse according to their clan, as inherited through their mother. The notion of taking care of family (referring to an individual longhouse) but also the community (referring to the longhouse village) was reinforced within the communities. Valuable teachings will influence the project by creating an environment where people can come together to support one another. Concepts from the longhouse have also been incorporated into the design to accommodate the growth of the community through the building being able to expand along with mindfully designing how light can enter into spaces. Additionally, spaces beyond the walls of the proposed building were carefully thought out and designed.

The site of the project is on the Six Nations of the Grand River, where a multi-generational housing project is proposed. The project is proposed along 4th Line, to best suit the community and their needs. As demonstrated throughout this thesis, the proposed building is inspired from community engagement, wampum belts, and Haudenosaunee longhouses to demonstrate how the culture of the Haudenosaunee can be reflected within their built environment to align with the needs of the community.

Chapter 2

2 Community Engagement

The intent is to study how community engagement is currently being incorporated into firms and then design my own process and run through a hypothetical project with a community to measure if the engagement techniques are successful. However due to limitations, community engagement has influenced my design in other ways. Community engagement has informed this thesis project by understanding how the community's history, traditions, and culture can impact a framework to design a building. Throughout many stages of the research and even design, I have continuously reached out to members of the community to gather the proper and correct information. The community has been very excited and pleased to share their knowledge with me.

2.1 Analysis

Community engagement has many understandings and means something slightly different among many people. It was essential to understand what community engagement[2] means to the design profession. The project commenced with my research on Indigenous and non-Indigenous designers' and architects' interpretations and how they engage the community in the design process.

Cornerstone Architecture, a non-Indigenous architecture firm located in London, Ontario; strongly believes in the client participating in the design process (figure 1). They begin with a questionnaire to understand if the client is willing to participate in the design process. A project is declined if the questionnaire reveals the client wants little to no say in the design. The design will proceed if the client is eager to participate.[3] The client becomes a member of the design

2 A general definition of community engagement, "the process of working collaboratively with community groups to address issues that impact the well-being of those groups." As stated by, "Definition of Community Engagement," Libor Definition from *Financial Times Lexicon*, http://lexicon.ft.com/Term?term=community-engagement.

3 Architecture, Cornerstone. *The Collaborative Design Manifesto.* (London, ON: Cornerstone Architecture Incorporated, 2013), 9-12.

team; clients have the ability to uncover ideas trained designers may have not thought about. The end result is a building the community takes ownership of.[4]

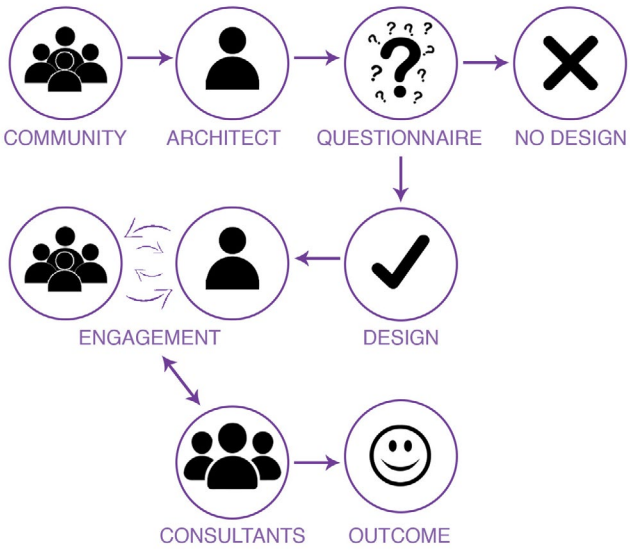


Figure 1: Cornerstone Architecture Community Engagement Diagram

MASS, a non-Indigenous consultant firm located in Toronto, Ontario; strongly believes in contact prior to meeting in person. They select participants to participate in their community engagement; the group consists of half men and half women, with a representation of minority groups. Most importantly, they attempt to understand the vision of the community.[5]

Indigenous architects Tammy Eagle-Bull, Harriet Burdett-Moulton, Eladia Smoke, and Patrick Stewart have similar understandings of community engagement; however each has slightly different approaches (figure 2). All emphasize that the information shared by the community participants does not create the design, however it strongly influences the design. They take time to learn about the community and identify community leaders.[6] To avoid being redundant in collecting information later on, the architects gather existing information with the community leaders and discuss what needs further clarification.[7] Design activities are then created to collect the necessary information. To ensure the community will participate in the activities and the information within is accurate, the leaders review information

4 Ibid., 19-23.
5 Chris Ellis, *Community Engagement.* Interview by author. October 29, 2018.
6 Kiddle, Stewart, and O'Brien, *Our Voices,* 36.
7 Elaida Smoke, *Community Engagement*. Interview by author. October 19, 2018.

collected. Once approved, the community is asked to participate within the design process by engaging in the designed activities.[8] Once the activities are completed, the architect then summarizes the findings and presents them back to the leaders for approval before designing.[9]

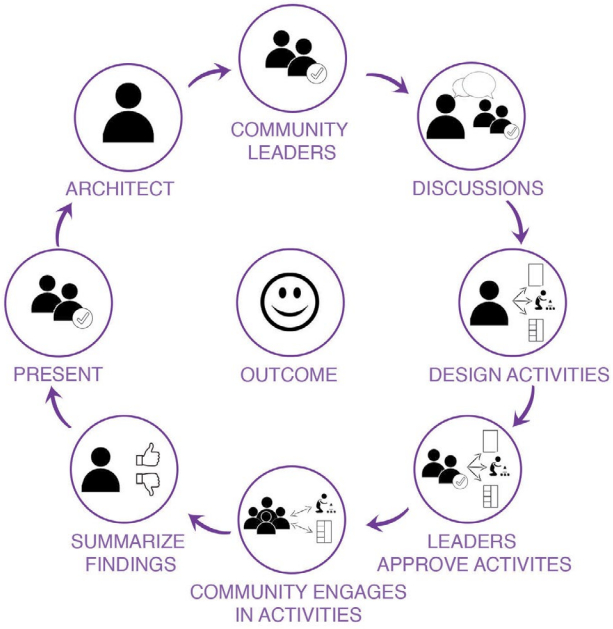


Figure 2: Indigenous Architect's Community Engagement Diagram

Community engagement can be categorized into the top down approach and the bottom up approach (figure 3). In the top-down approach, the architect designs according to how they want and the community gets a building. The bottom-up approach includes the community in the design and brings the community's vision to reality.

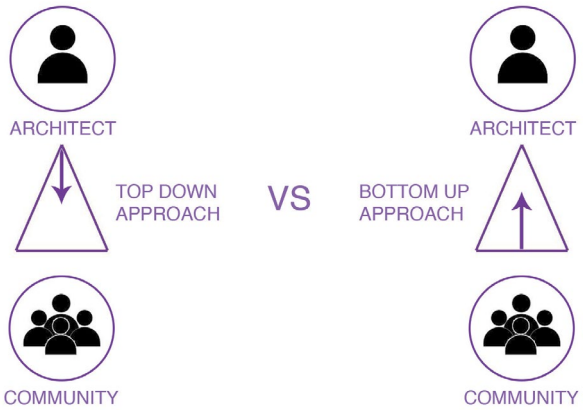


Figure 3: Top-Down Versus Bottom-Up Approach in Design

8 Kiddle, Stewart, and O'Brien, *Our Voices*, , 186-187.
9 Harriet Burdett-Moulton, *Community Engagement*. Interview by author. November 8, 2018.

My understanding of community engagement within the design profession is a continuous realm of communication to understand information in order to influence the built environment. The role of the architect is to become a translator: the community contains the information and the ideas, however it does not necessarily have the knowledge to translate the information into a built form, thus an architect brings the community's ideas into a reality through design.

The framework being developed is specific to the Haudenosaunee located on Six Nations of the Grand River. The Haudenosaunee consist of six nations: Mohawk, Oneida, Onondaga, Cayuga, Seneca, and Tuscarora. All six nations live in harmony on Six Nations of the Grand River reserve located in Southern Ontario.

Studying community engagement and forming an interpretation based on the research creates an independent process for engaging with the community of Six Nations of the Grand River to complete the hypothetical design project. The project reflects the needs of the community and allows the members to take ownership of the building through the process. The community is a key component of the entire process from research to the designed project.

I formulated a model to gather the visions and values that would inform the type of program to propose for the project. Once the program is determined, community leaders are identified and a small contact group with the interest of the community at heart is created. Interactive activities such as diagramming exercises, design charrettes, and block exercises allow the community to communicate their ideas. The results of the interactive activities are then analyzed and inform a priority list of requirements. The results are shared with the community leaders to ensure all parties are in agreement. The design would then proceed with increased communication with the community leaders to get their feedback on the design as it develops.

During the term I reached out to the Six Nations Council Administration who connected me with the Development Corporation. Within the Development Corporation is a sub-department called Community Planning.[10] I contacted Jake Bastedo, whose position is community planner.

10 Jake Bastedo shared they are a very small team operating under the Development Corporation with a focus on updating the community plan and developing a plan for Six Nations of the Grand River. It is important to note this department is not like a planning department in a conventional sense, meaning they do not have a complete understanding of all developments from the past or the plans for the future. As mentioned by, Jake Bastedo. *Inquiry for Six Nations*. Interviewed by author. October 24, 2018

He had mentioned the community has faced several challenges in their built environment.[11] Bastedo, excited about the opportunity the thesis project could create, suggested contacting the Development Corporation Director of Projects, Development Corporation Projects Administrator, the Director of Public Works, and the Manager of Public Works. To date I have been unable to make contact with any of these departments.

The community planning team of Six Nations is updating the community plan through several engagement activities. Thus far the team has determined that the community wants to see the buildings designed and built in a way that reflects their values. To achieve this, a focus group for updating the Built Environment with specific focus on engagement around Housing and Infrastructure was scheduled for March 29, 2019.[12]

Due to many limitations, specifically making connections with community leaders and restrictions for whom I can contact in the allotted time, I have shifted the objective of community engagement. Community engagement has informed this thesis project by understanding how the community's history, traditions, and culture can impact a framework to design a building. Community engagement is an ongoing process, even though not all aspects of community engagement are able to be carried out to the fullest potential, and therefore the way it is incorporated into my work has changed, I will design my project with ways of engagement in mind.

11 Bastedo, and co-worker Stephanie Burnham shared their thoughts on the lack of community engagement in the built environment. They both felt a main contribution was budget constraints. The Public Works Director shared with them how they have to build five million dollar projects on two million dollar budgets. Projects must be designed and ready to execute as soon as federal funding might become available. It is evident with small budgets, and unpredictable timing, engaging the community is difficult. Bastedo and Burnham shared that the community definitely wants to see buildings made in a way that reflects their values. As mentioned by, Jake Bastedo. *Inquiry for Six Nations*. Interviewed by author. October 24, 2018

12 Six Nations of the Grand River Development Corporation, *This Is What We Heard*, Six Nations of the Grand River Development Corporation, http://sndevcorp.ca/this-is-what-we-heard/.

Chapter 3

3 Precedent Case Studies

Pre-contact Indigenous architectural typologies such as longhouses, sweat lodges, and wigwams to list a few, have been used multiple times in architecture as an influence. However, it is used as physical appearance of the building form, sometimes with subtle references to the traditional principles and values. Brian Porter, principal architect of Two Row Architect and Chris Cornelius, principal architect of studio:indigenous are studied to understand how their work is inspired by traditional typologies but is transformed into a contemporary design to reflect the community's rich and vibrant culture within their built environment.

3.1 Two Row Architect - Brian Porter (Oneida)

Two Row Architect, an Indigenous owned and operated architecture firm located on Six Nations of the Grand River, designs with the Seven Generations teachings in mind, making design sustainable, and blending together the indoors and outdoors. The firm incorporates historical influences of the area and addresses the community's needs.[13] The contemporary design incorporates subtle gestures while being respectful to the culture and people.

Two Row Architect designed the Grand River Education and Training Opportunity (G.R.E.A.T) Centre located in Ohsweken in 2003. The contemporary design incorporated a multi-purposed program under one roof while expressing traditional principles and values.[14] The G.R.E.A.T Centre has hidden Indigenous precedence within the function of the building and in the architecture. Brian Porter shared, "*A typical longhouse village had multiple functions taking place in one area… the National building code legislation allowed for the layout to be achieved.*"[15]

13 Brian Porter, *G.R.E.A.T Centre Project*. Interview by Haley Schumacher and Melissa Snodgrass. October 14, 2015.
14 Ibid.,
15 Porter, *G.R.E.A.T Centre Project.*

The floor plan reflects a Haudenosaunee longhouse village, which expressed the traditional principles and values of the Haudenosaunee people and allowed the program to serve the desired needs (figure 4).[16] Steve Isaacs, site supervisor who later became the maintenance worker, expressed the layout of the building to be confusing especially to people whom are new to the building. The building is not clearly marked and is difficult to navigate; public and private spaces are not easily identified. For example, there are 16 doors to enter into the building, but double doors indicate the main entries. Both of the main entrances face east.[17]

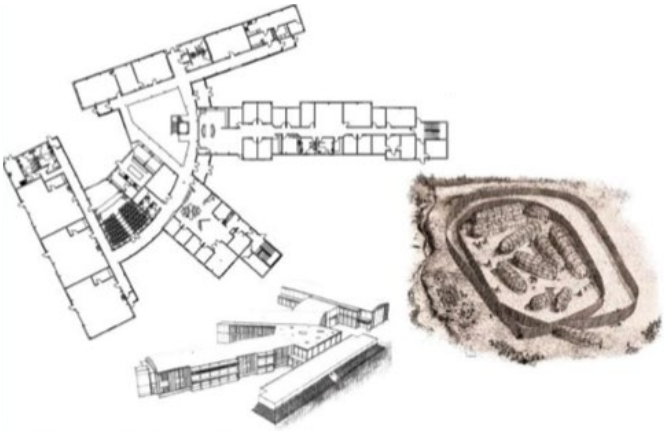


Figure 4: Two Row Architect. *G.R.E.A.T Centre – Panel.* Digital Image. The G.R.E.A.T Centre.

Other aspects of the building were also influenced by the Indigenous culture. The in floor heating system in the building is derived from a sweat lodge,[18] the heat comes from a centre heat source and radiates through the floor.[19] Throughout the G.R.E.A.T Centre, it is evident the material of choice was steel, which was also influenced by the history of the Haudenosaunee.[20] The G.R.E.A.T Centre involved the community throughout the entire process. Community members donated generous donations to help offset the overall cost of the project. Isaacs was

16 Kim Anderson, *Ten GREAT Years of Opening Doors to Our People.* Grand River Employment and Training. http://www.greatsn.com/pdf/GREATfinalweb.pdf., 8.

17 Entry from the east is common within Indigenous cultures because it represents the first light of the day. As shared by Steve Isaacs. *G.R.E.A.T Centre Project-Site Visit*. Interview by Haley Schumacher and Melissa Snodgrass. October 14, 2015.

18 In a sweat lodge, the heat source is created by the warmed Grandfather rocks which are brought into the sweat lodge and placed in the hole dug in the centre of the lodge. The heat from the rocks heat the ground along with the air within the lodge.

19 Porter, *G.R.E.A.T Centre Project.*

20 The history of the ironworkers began in the early 1900's when the Mohawks from Six Nations were hired to work on multiple significant projects, such as the Empire State Building, George Washington Bridge, and the World Trade Center to name a few. From this point Indigenous people trained in ironwork travelled all over North America to participate in ironwork projects. As mentioned by Porter, *G.R.E.A.T Centre Project.*

in charge of the steel portion of the job. Prior to the G.R.E.A.T Centre project he had been an ironworker for 25 years and held a lot of knowledge on the topic. Unionized ironworkers were hired to do the steel work on site, even though the job itself was not a union job.[21] Local Onondaga artist, Arnold Jacobs, designed the exterior. Jacobs wanted to contrast the other buildings around therefore he selected earth tones (figure 5). The colours also capture the colours of Haudenosaunee pottery designs.[22] On the exterior of the building the clans are represented, and above the main entrances all six nations are represented.[23] Ken Parker from a local business named Sweet Grass Gardens was the landscape designer for the project. He introduced 40 to 50 different indigenous plant species into the site. A subtle gesture Parker did was frame a view of the white pine when exiting the theatre space (figure 6). The white pine represents the Tree of Peace, "*This white pine was planted to symbolize a return to traditional ways: it is symbolic of the tall white pine that was planted to respect the Great Law of Peace that unified the Five Nations under one law to form the Confederacy*."[24]

The users of the building have outgrown their space. Two Row Architect designed an expansion for a second floor of the G.R.E.A.T Centre, however due to lack of finances the addition has not been built. Instead, to accommodate the growing demand, office spaces have been divided, utility rooms have been converted into offices, and an addition was added. The theatre holds 84 people; unfortunately most events have larger crowds and additional chairs are brought into the space to create extra seating. The central space is also over crowded, seating is limited and the noise in the space becomes an issue.[25]

21 Isaacs. *G.R.E.A.T Centre Project-Site Visit*.
22 Anderson. *Ten GREAT Years,* 9.
23 Isaacs. *G.R.E.A.T Centre Project-Site Visit*.
24 Anderson. *Ten GREAT Years,* 9.
25 Isaacs. *G.R.E.A.T Centre Project-Site Visit.*

Figure 5: G.R.E.A.T Centre. *G.R.E.A.T Centre – Main Entrance*. Digital image. Grand River Employment and Training. https://www.greatsn.com

Figure 6: G.R.E.A.T Centre. *G.R.E.A.T. Centre – Tree of Peace*. Digital image. Grand River Employment and Training. https://www.greatsn.com

3.2 studio:indigenous - Chris Cornelius (Oneida)

Architect Chris Cornelius' firm studio:indigenous, an Indigenous design and consulting firm focusing on translating the Indigenous culture into architecture,[26] avoids common iconographic designs and direct references to Indigenous typologies and symbolism. Every project consists of an investigation of the client's needs. The work produced not only embodies stories and traditions of the past, but it also develops a contemporary story.[27] Material selection is also important to Chris Cornelius, founder and architect of studio:indigenous, as he believes it should support and help communicate his concepts. "*I like to use materials that are creating buildings that are going to be around in a hundred years that are from the Earth, that aren't too highly fabricated: stone, concrete, wood. Or if it's metal, copper, as copper comes from the Earth*."[28]

Wiikiaami was designed by studio:indigenous in 2017, an exhibition located in Columbus, Indiana on the site of the First Christian Church. Wiikiaami was designed precisely to align with the church's iconic campanile and to mark the autumn equinox (figure 7).[29] Cornelius designed a structure to reflect the way Indigenous people see the world, nature, and buildings, and to pay respect to the Indigenous people of Indiana. Wiikiaami was designed from inspiration of the wigwam[30] (figure 8). In the native language of the Miyaamia, wiikiaami means wigwam.[31] In addition to the name, Wiikiaami respected the natural surroundings and made reference to many historical components of a wigwam and how buildings are designed today.

26 studio:indigenous, *About*, studio:indigenous, https://www.studioindigenous.com/about/.

27 Matthew Messner, "studio:indigenous Wants to Design Architecture Rooted in Native American Worldviews," *The Architects Newspaper,* January 16, 2017, https://archpaper.com/2017/01/studio-indigenous-profile/.

28 Kristin Butler, "Chris Cornelius Translates Culture in to Contemporary Architectural Design," *Indian Country Today*, February 3, 2017, https://newsmaven.io/indiancountrytoday/archive/chris-cornelius-translates-culture-in-to-contemporary-architectural-design-X4MoqSWpVky87fY5zsquQg/.

29 Eleanor Rust. *Wiikiaami*, Exhibit Columbus, https://exhibitcolumbus.org/exhibition/wiikiaami.

30 Wigwams were the traditional dwellings of the Miyaamia people of Indiana. Wigwams were made out of saplings put into the ground and bent to create a dome like structure and covered with bark or mats. As mentioned studio:indigenous, *Wiikiaami Film*, studio:indigenous, https://www.studioindigenous.com/wiikiaami_film/.

31 studio:indigenous, *Wiikiaami*, studio:indigenous, https://www.studioindigenous.com/wiikiaami/.

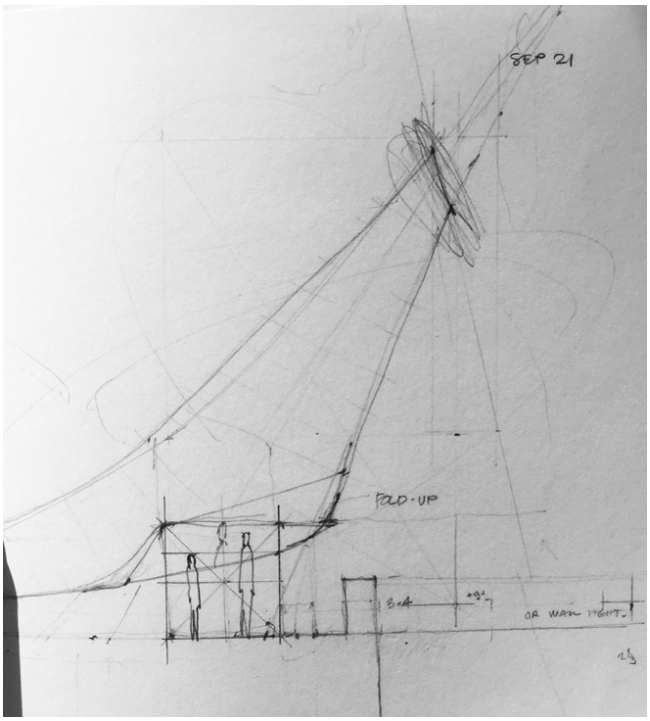


Figure 7: studio:indigenous. *Sketch of Equinox Aligning with Wiikiaami*. Digital image studio:indigenous-wiikiaami. https://www.studioindigenous.com/wooloaami/

Figure 8: studio:indigenous. *Wiikiaami - Inspiration Board*. Digital image. studio:indigenous-wiikiaami. https://www.studioindigenous.com/wiikiaami/ com

Cornelius mentioned during an interview that he draws parallels to how the wigwam structure was made traditionally and how he designed and built Wiikiaami in a contemporary way with modern materials. Humans made the entire structure with their hands, as structures would have been built in the past. The structure was made out of steel rebar that was welded together and covered with a steel skin.[32] The skin was unique as it resembled eagle feathers and created patterns by using sunlight and shadows.[33] Depending on the light exposure, the steel skin appeared transparent (figure 9) and other times it is more opaque (figure 10). In order to achieve the construction of the structure, a wood form, cut on a CNC machine was used as scaffolding.[34] A local company volunteered their time and craftsmanship to assemble the 30-foot structure on site (figure 11).[35]

Figure 9: studio:indigenous. *Wiikiaami - Transparent.* Digital image. studio:indigenous-wiikiaami. https://www.studioindigenous.com/wiikiaami_film/

Architecture has the ability to be sympathetic to nature, but in order to achieve this, the site and natural surroundings need to be considered when designing. The site of the First Christian Church contains a lot of trees with a dense canopy; with the expectation of the corner where the

32 studio:indigenous, *Wiikiaami Film*, studio:indigenous, https://www.studioindigenous.com/wiikiaami_film/.
33 Eleanor Rust. *Wiikiaami*, Exhibit Columbus, https://exhibitcolumbus.org/exhibition/wiikiaami.
34 studio:indigenous, *Wiikiaami Film*, studio:indigenous, https://www.studioindigenous.com/wiikiaami_film/.
35 Eleanor Rust. *Wiikiaami*, Exhibit Columbus, https://exhibitcolumbus.org/exhibition/wiikiaami.

Figure 10: studio:indigenous. *Wiikiaami - Opaque.* Digital image. studio:indigenous-wiikiaami. https://www.studioindigenous.com/wiikiaami_film/

Figure 11: studio:indigenous. *Wiikiaami - Construction on Site.* Digital image. studio:indigenous-wiikiaami. https://www.studioindigenous.com/wiikiaami_film/

project resides, the canopy has a break (figure 12). Wiikiaami has a slight lean forward over the walkway and tucks into the opening of the tree canopy (figure 13). The design considered the natural environment and reduced disturbing the natural elements of the site.[36]

Figure 12: studio:indigenous. *Wiikiaami - Site Plan*. Digital image. Studio:indigenous-wiikiaami. https://www.studioindigenous.com/wiikiaami/

Figure 13: studio:indigenous. *Wiikiaami - Lean Towards Break in Canopy.* Digital image. Studio:indigenous-wiikiaami. https://www.studioindigenous.com/wiikiaami/

36 studio:indigenous, *Wiikiaami Film*, studio:indigenous, https://www.studioindigenous.com/wiikiaami_film/.

Chapter 4

4 Wampum Belts

Wampum belts have informed this thesis by understanding how relationships and agreements were formed and communicated. "*Indigenous people have very powerful symbols that have represented their culture for thousands of years.*"[37] Wampum belts are examples of powerful symbols used to narrate the history of the Haudenosaunee. These symbols are used to record an event,[38] and they represent unity, equality, harmony, friendship, and storytelling as discussed below. To understand the process of wampum belts, recreations were made by dot painting. These recreations enriched the research process by being able to make connections across different belts and understanding what geometries meant which impacted the translation of research into design.

4.1 Hiawatha Belt

The Hiawatha Belt (figure 14) is inspired from a Haudenosaunee longhouse, which went from east to west with a fire in the centre. The belt represents an agreement between the five nations; the belt was a promise amongst them to support each other in unity. The centre symbol is the Tree of Peace, where the five nations buried their weapons beneath.[39] The belt can be read from left to right: the first square represents the Mohawk and their territory. The second represents the Oneida and their territory. The tree represents the Onondaga and their territory; as well as the nations all being united by one heart, which is the Great Law of Peace. The next square represents the Cayuga and their territory, and the final white square represents the Seneca and their territory.[40] The relationship among each other is also demonstrated through the line connected to each nation.[41] The white lines on either end represent the invitation to any

37 Kiddle, stewart and O'Brien, *Our Voices*, 96.
38 Haudenosaunee Confederacy, *Wampum*, Haudenosaunee Confederacy. https://www.haudenosauneeconfederacy.com/wampum/.
39 Museum of Ontario Archaeology, *Wampum*, Museum of Ontario Archaeology, January 23, 2015, http://archaeologymuseum.ca/wampum/.
40 Susan M. Hill, *The Clay We Are Made Of: Haudenosaunee Land Tenure on the Grand River*. (Winnipeg. Manitoba: University of Manitoba Press, 2017), 32-33.
41 Ibid., 33.

nation if they choose to follow the Haudenosaunee Confederacy.[42] It is understood that the belt symbolizing peace (white) was established out of war (purple).[43]

4.2 Two Row Wampum

The Two Row Wampum Belt (figure 15) symbolizes cooperation and serving a common interest made among the Dutch and the Haudenosaunee. The belt represents one river with two vessels traveling alongside each other. Each vessel is different and contains people, traditions, laws, and ways of life. The vessels do not cross paths, but they stay connected to each other.[44] The belt can be read as two rows of purple separated by three rows of white. The purple rows represent nations and their vessels, one being a ship to represent the Dutch and the other being a canoe to represent the Haudenosaunee.[45] The white rows symbolize the connection to each other through peace, friendship, and mutual respect. This belt represents the agreement to live as neighbours in peace and friendship by not interfering with one another, reinforcing the notion that different worldviews could exist simultaneously while maintaining harmony.[46]

4.3 Dish with One Spoon Wampum Belt

The Great Law of Peace inspired the Dish with One Spoon Wampum Belt (figure 16) as it outlines several responsibilities in regards to land, and the relationship with it. The belt can be read as a dish with a spoon in the centre, which represents equal shares of wild game and peace among people.[47] It also reinforces the notion of only taking what you need, "we should take only what we need, leave something for others, and keep the dish clean."[48]

42 Text, Historical Gallery, *Wampum and Wampum Belts*, Woodland Cultural Centre, Brantford, Ontario.
43 Hill, *The Clay We Are Made Of*, 33.
44 Ibid., 85-86.
45 Museum of Ontario Archaeology, *Wampum*, Museum of Ontario Archaeology, January 23, 2015, http://archaeologymuseum.ca/wampum/.
46 Hill, *The Clay We Are Made Of,* 86.
47 Ibid., 42.
48 Museum of Ontario Archaeology, *Wampum*, Museum of Ontario Archaeology, January 23, 2015, http:// archaeologymuseum.ca/wampum/.

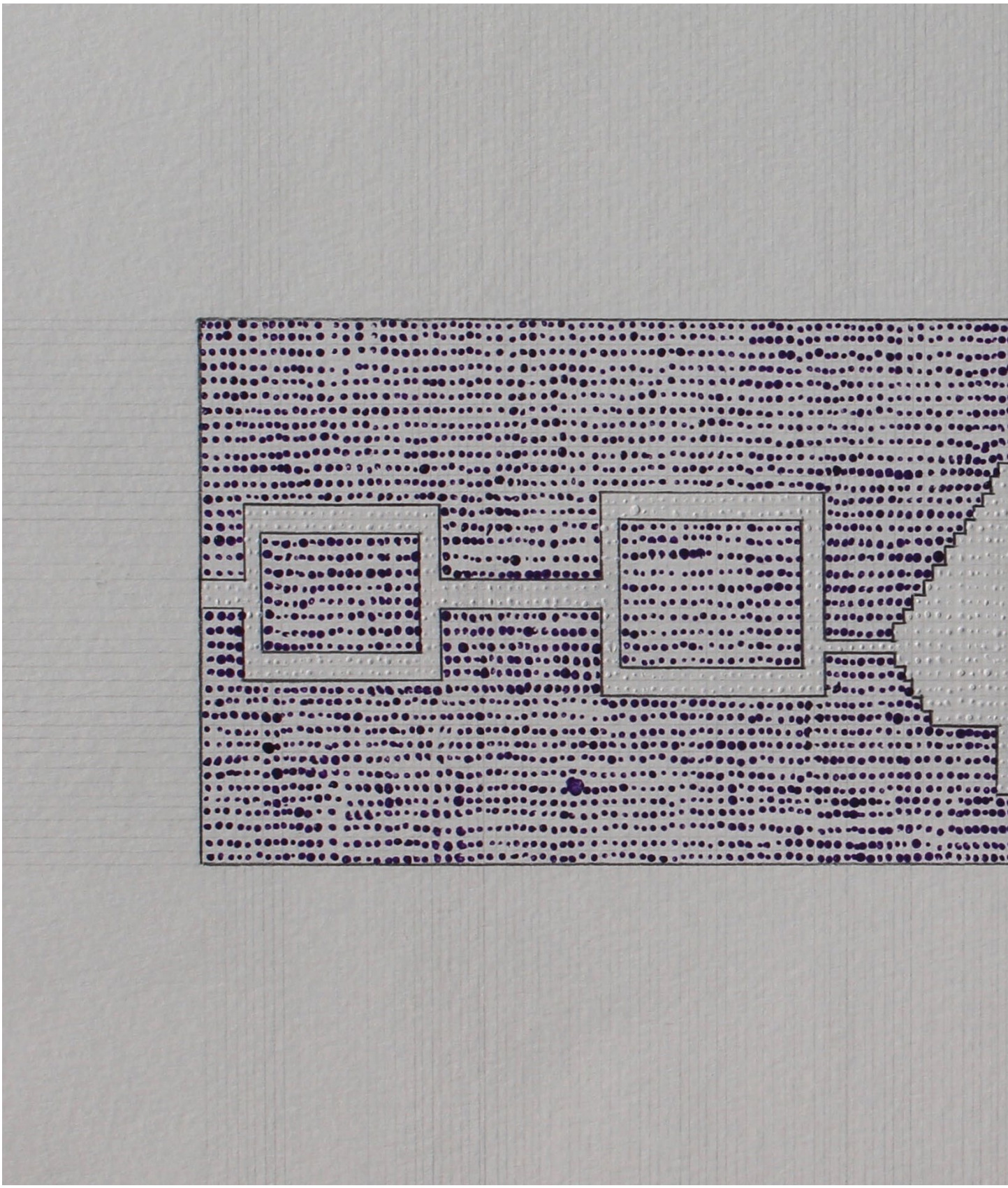
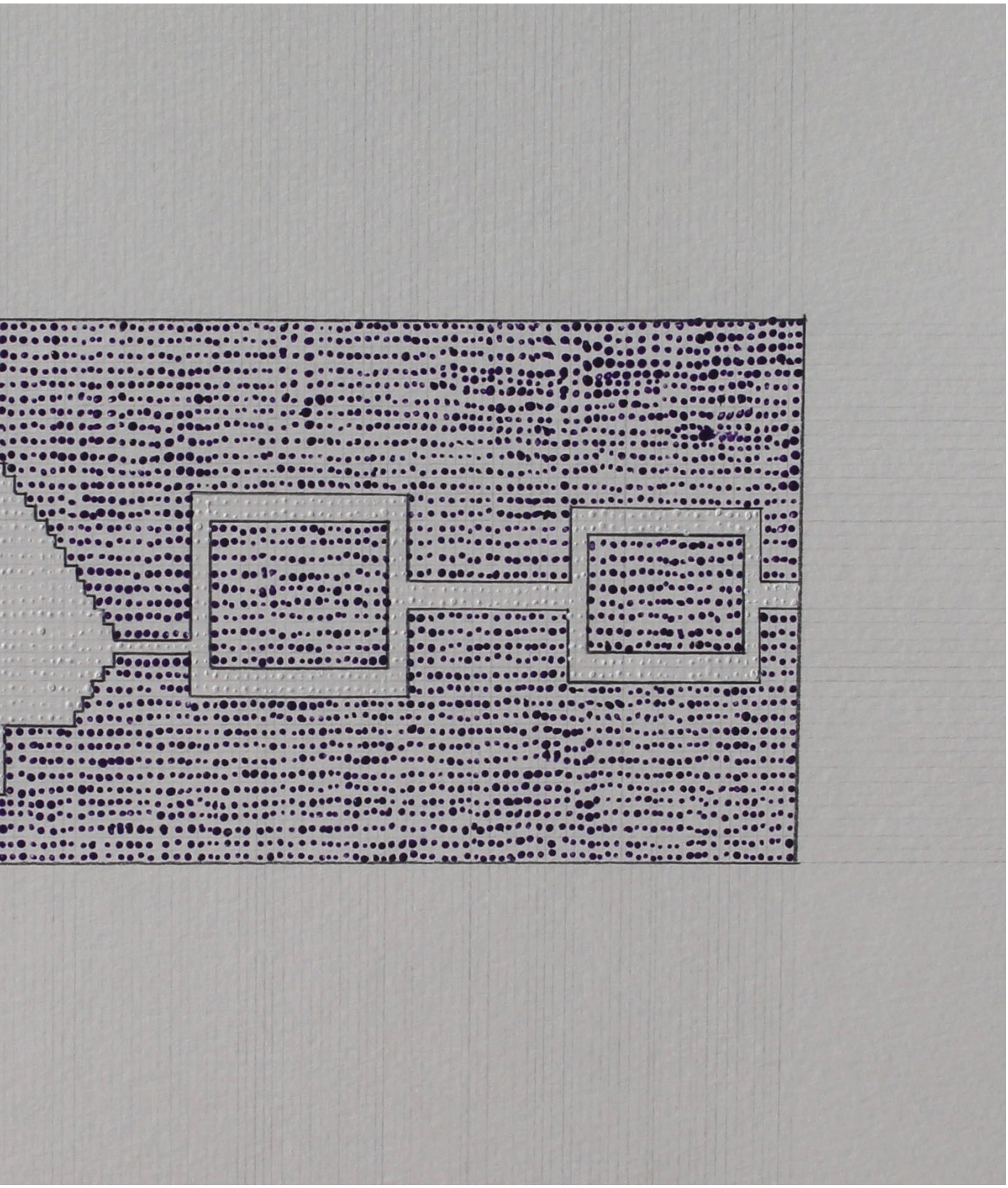


Figure 14: Hiawatha Belt Recreation



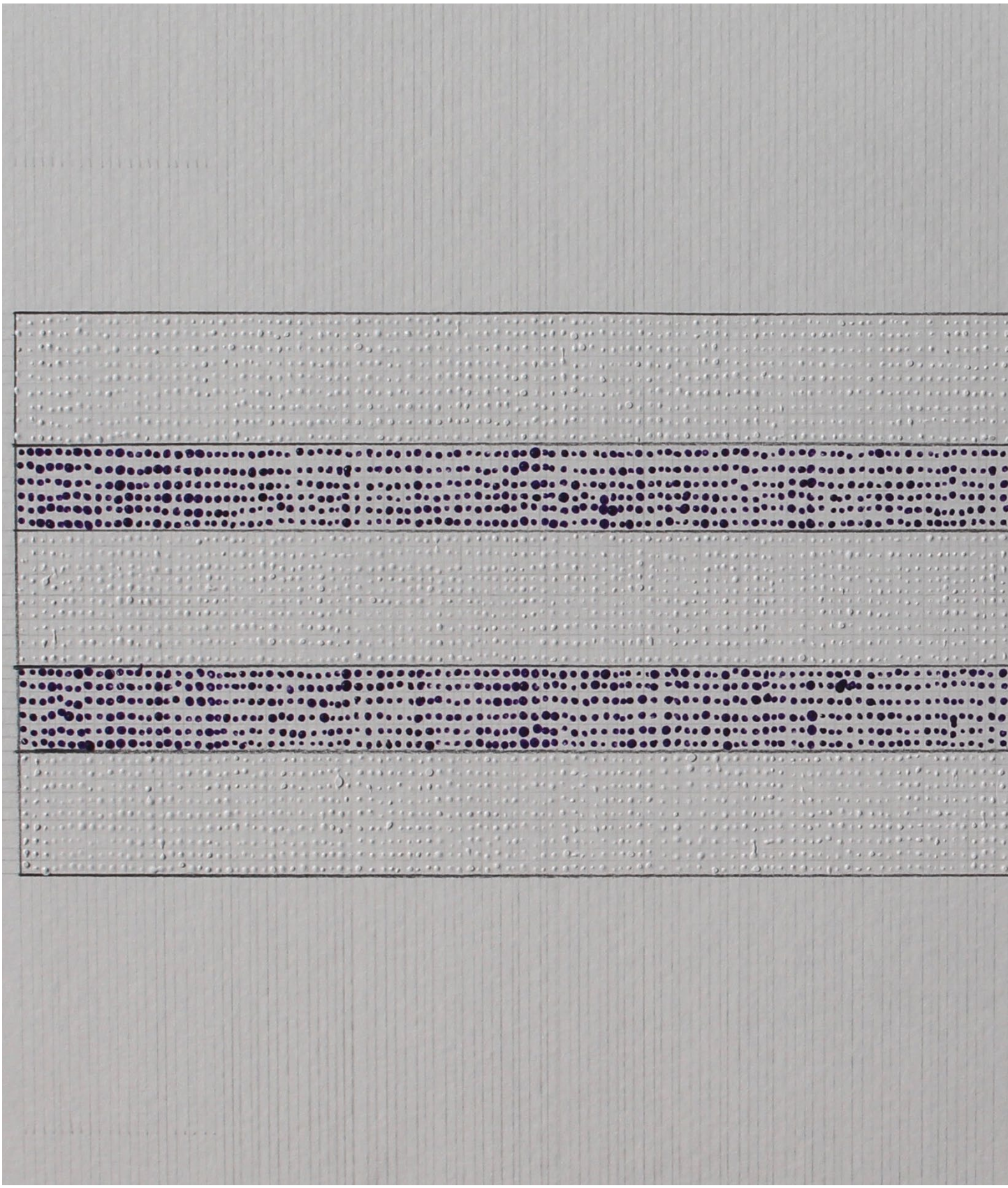
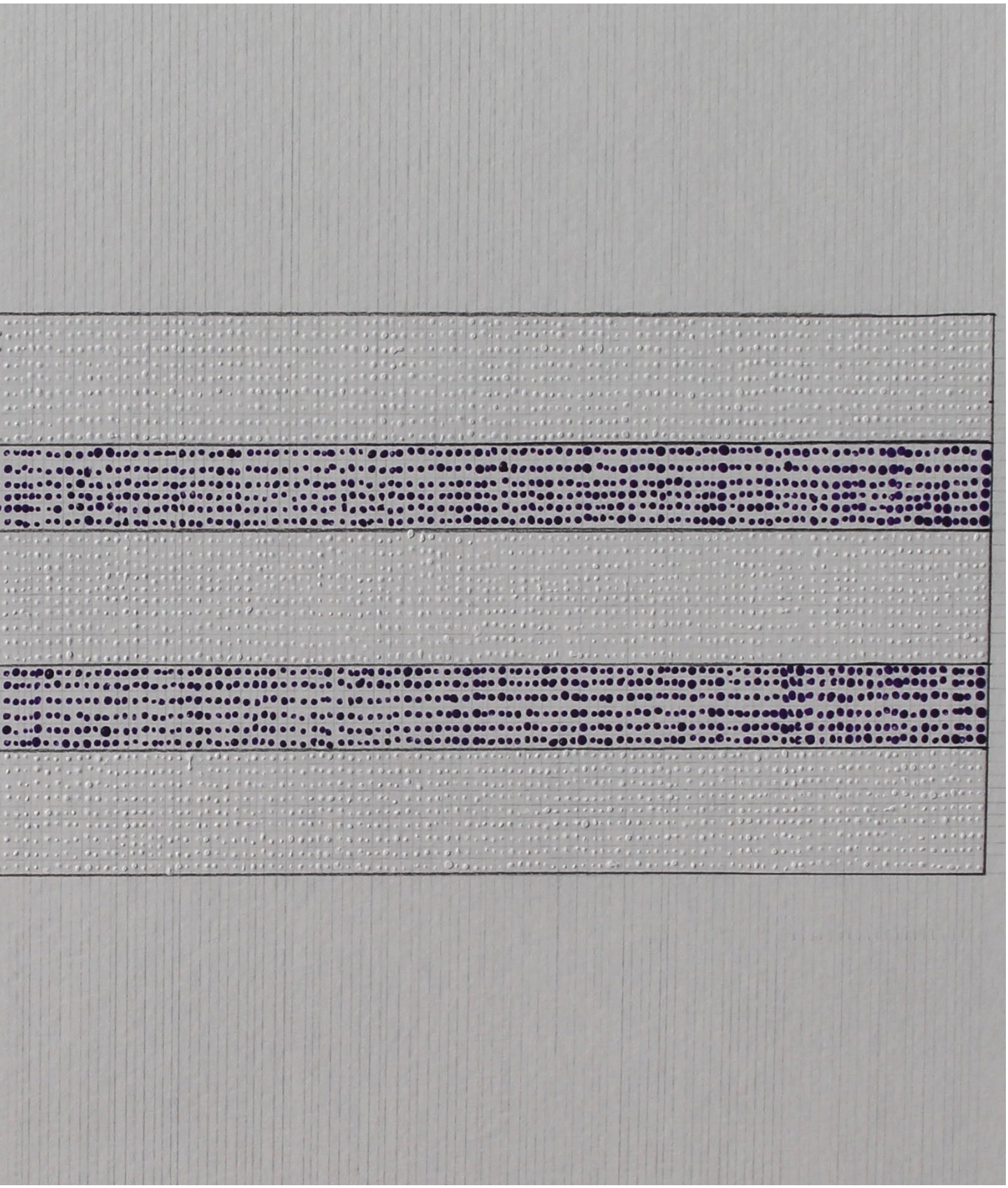


Figure 15: Two Row Wampum Recreation



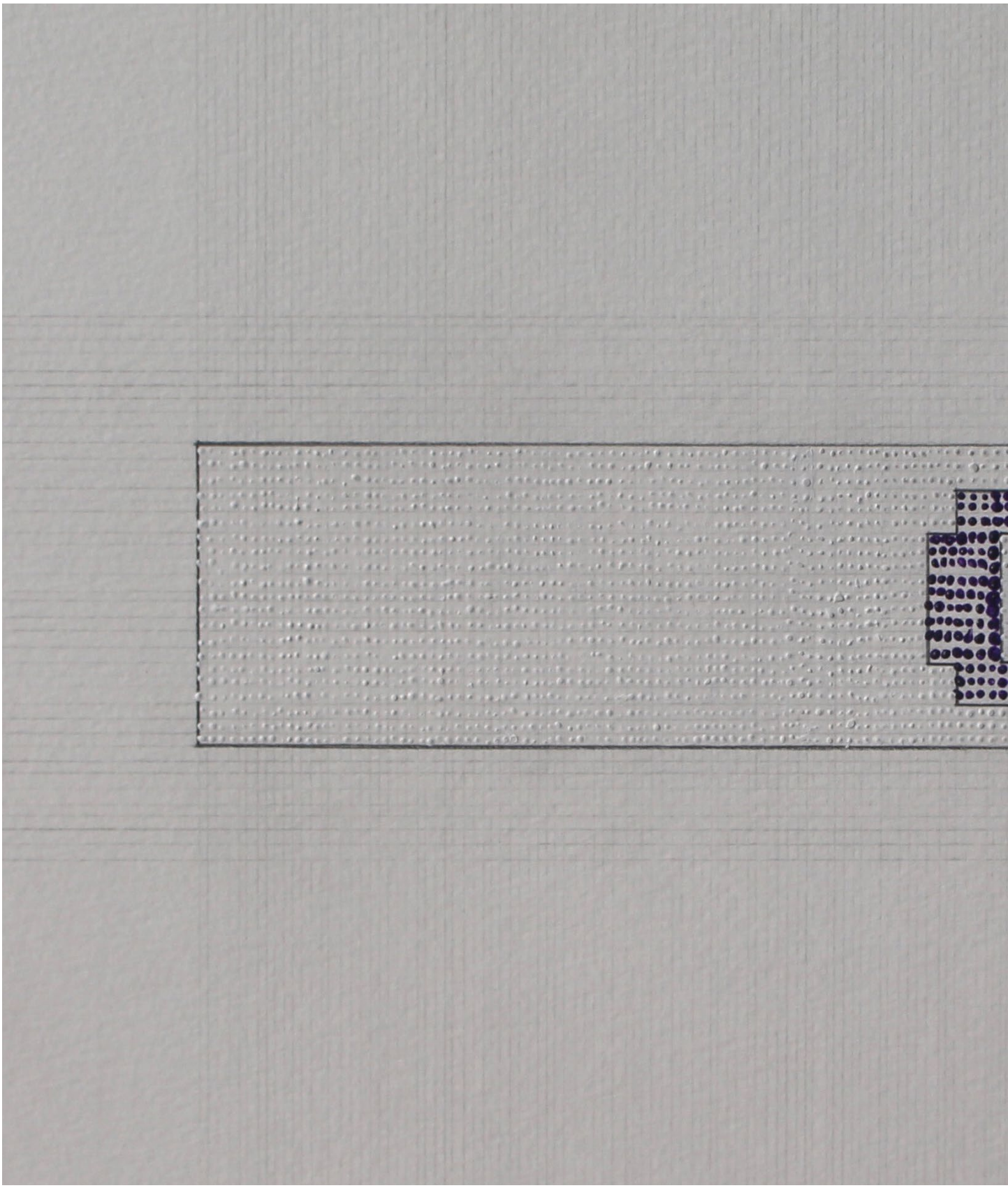
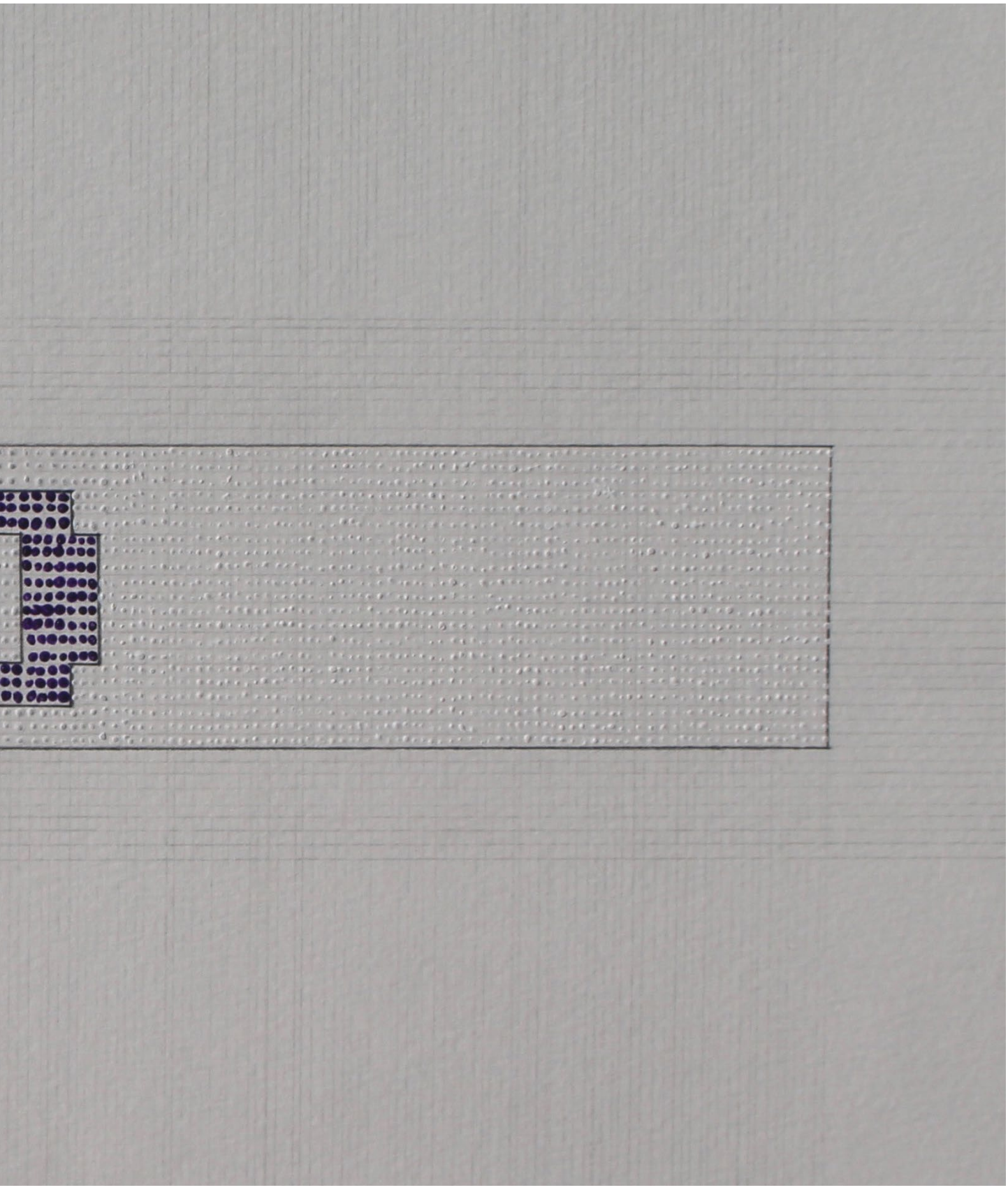


Figure 16: Dish with One Spoon Recreation



4.4 Indigenous Knowledge Guardian Belt

The Indigenous Knowledge Guardian Belt (figure 17) represents the importance of oral traditions and storytelling being passed down from generation to generation. The knowledge is passed down to the younger generations in order to guide them with a pure heart. The belt represents an Elder and two younger people whom have a pure heart. The outline around the figures represents the protection of language, culture, and wisdom of the ancestors as the teachings are passed on.[49]

4.5 Covenant Chain

The Covenant Chain (figure 18), also known as the Friendship Belt, was made between the Haudenosaunee and the English to symbolize an everlasting peace. The belt can be read as two figures, one on either end of the belt connected by a line. The purple figure represents the Haudenosaunee and the white figure represents the English. The line connecting the two figures represents a silver chain of friendship.[50] The chain symbolizes the loyalty and the everlasting attachment of the two nations in quest for peace, alliance, and friendship.[51]

4.6 Evergrowing Tree Belt

The Evergrowing Tree Belt (figure 19), also known as the Wing, the Dust fan of Council Peacekeeper of the Confederate Nations Belt, and the Great Belt of Confederacy[52] was made to represent the Tree of Peace and to explain the Great Law. The Great Law includes the roles and responsibilities of the people, including the chiefs, clan mothers, and faithkeepers.[53] The belt

49 Six Nations Polytechnic, "Photo of the Indigenous Knowledge Guardian Belt" in *Speak Mohawk,* (Six Nations Polytechnic, ON: Thornton Media Inc, 2017).

50 The silver chain started as a rope that metaphorically united the Mohawks with the Dutch settlers. Later, the rope evolved into an iron chain that metaphorically united the Mohawks with the New Netherlands. After that, the iron chain extended to the English once they conquered the New Netherlands. Eventually, the iron chain changed to a silver chain. (Kathryn V. Muller. "The Two "Mystery" Belts of Grand River: A Biography of the Two Row Wampum and the Friendship Belt." *American Indian Quarterly* 31, no. 1 (2007): 132-133. http://www.jstor.org/stable/4138898.).

51 Ibid.

52 Text, Historical Gallery, *Wampum and Wampum Belts*, Woodland Cultural Centre, Brantford, Ontario.

53 Onondaga Nation, "Dust Fan Belt, " Onondaga Nation People of the Hills, http://www.onondaganation.org/culture/wampum/dust-fan-belt/

can be read as a tree- the Evergrowing Tree. The roots are represented in white, which spread out (one to the north, one to the east, one to the west, and one to the south) to represent peace and strength. If someone outside of the Haudenosaunee nation wishes to follow the Great Law they can follow the roots, which would lead them to the tree. If they promise to obey the wishes of the council, they are welcomed to take shelter beneath the long leaves.[54]

4.7 Significance of Wampum Belt Study

I have incorporated the significance of a wampum belt into my design to build relationships and trust among the Haudenosaunee. By understanding the significance of wampum belts historically and the symbolism used, I have created a wampum belt, named the Inspiration Belt, to represent my process and approach to design. The Inspiration Belt can be used as a communication tool to engage the community.

The Hiawatha Belt, the Covenant Chain, the Dish with One Spoon Wampum Belt, and the Indigenous Knowledge Guardian Belt inspired the Inspiration Belt (figure 20). The belt can be read from left to right, starting with a circle within a square to represent the Vitruvian man, indicating proportion is based off the ideal man. Next, the Tree of Peace, representing an agreement has been met and all nations are united together. The following square represents the Haudenosaunee nations and their territory. The circle represents equality and equal sharing between everyone.

Next, are five figures; the heights of the figures vary to represent the people of the community of all ages. The figures are represented with pure hearts. The belt starts disconnected from the left side to emphasize no one is able to join on this side. Between the symbols a line begins as a dash and later transforms into a solid line, the dash represents the process changing; the solid represents being connected together and anyone can join the process as long as they promise to follow the agreement made with the Tree of Peace. The white symbolizes reconciliation and the purple symbolizes dominance, therefore it can be understood that the belt represents we are

54 Text, Historical Gallery, W*ampum and Wampum Belts*, Woodland Cultural Centre, Brantford, Ontario.

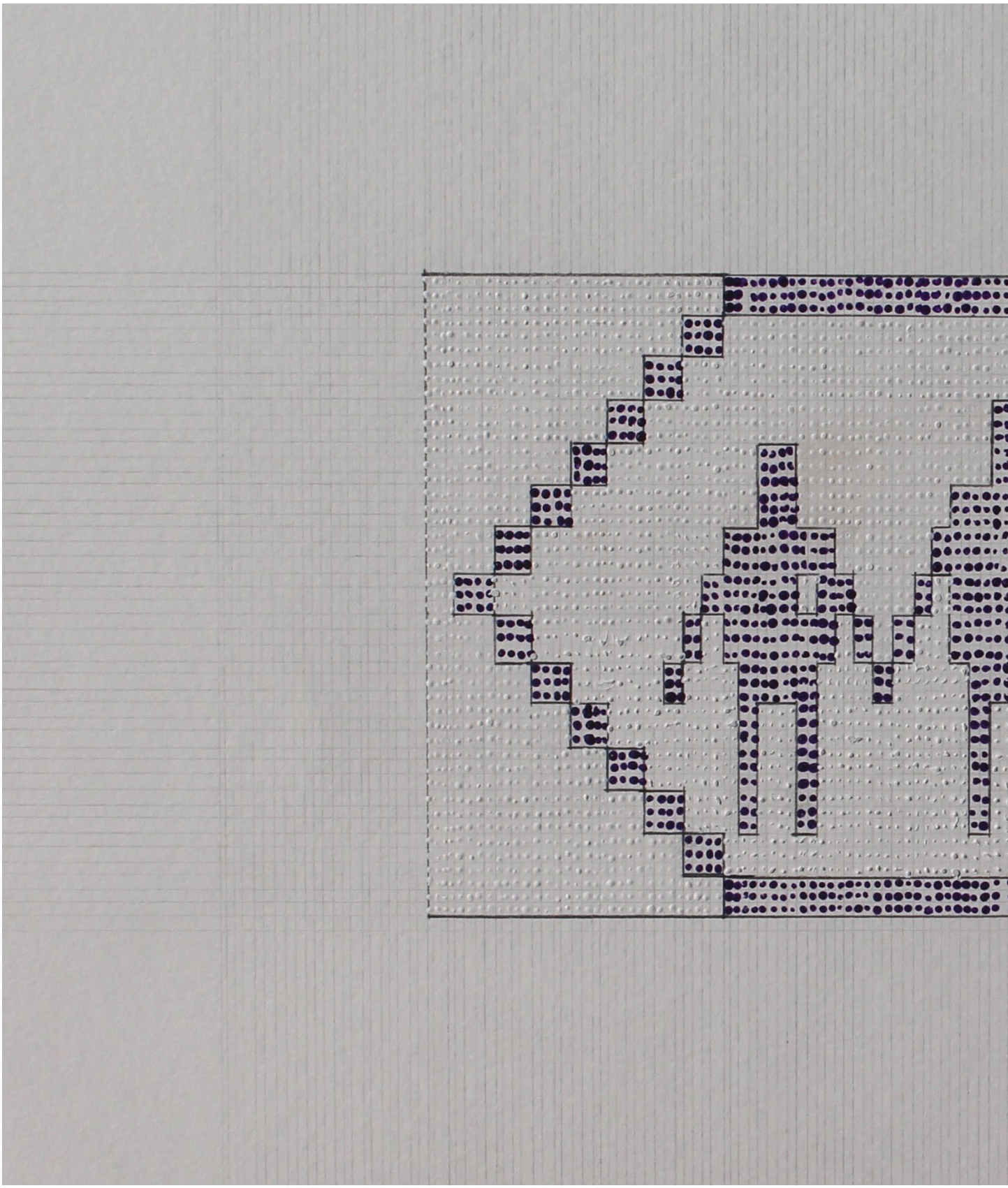
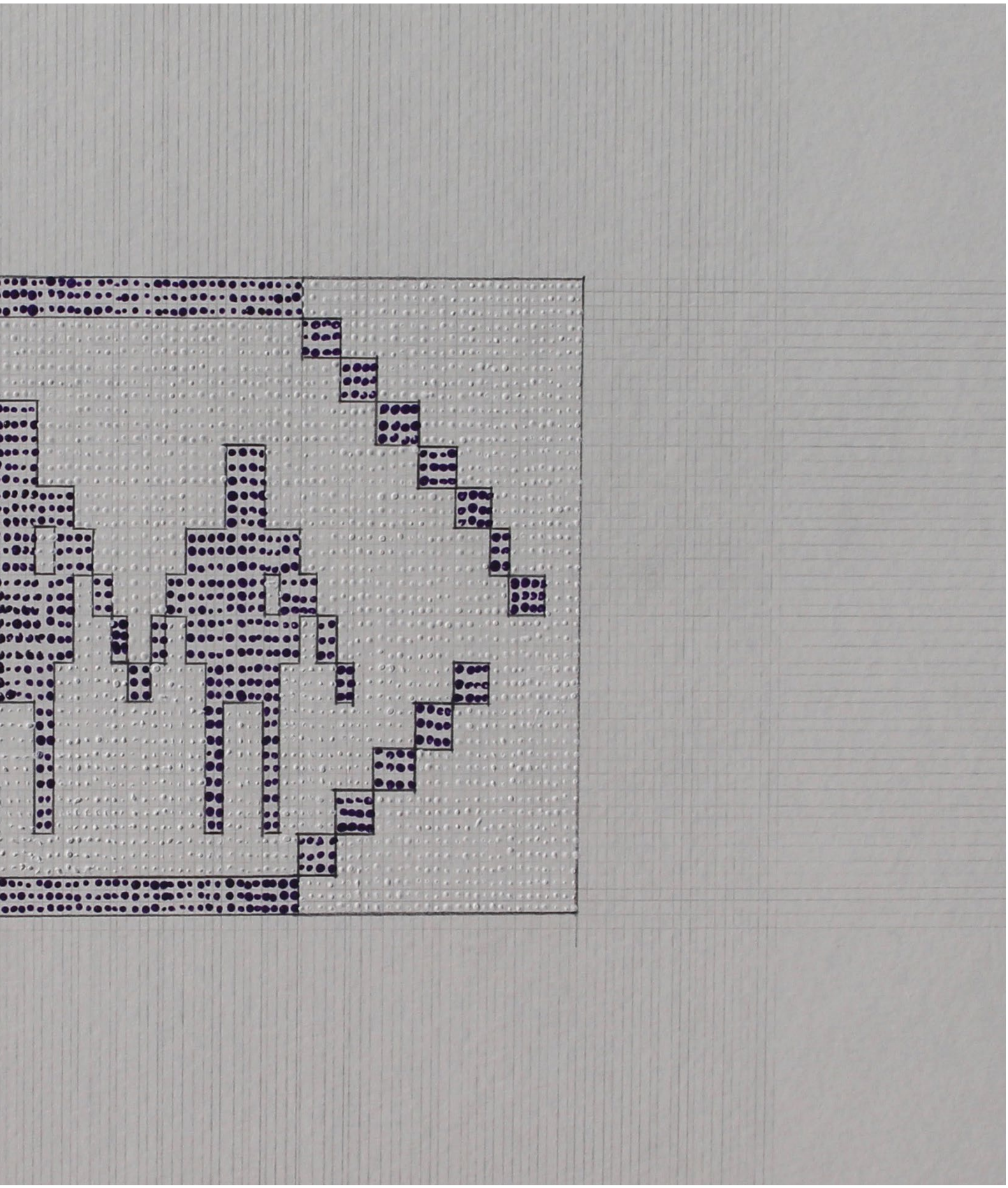


Figure 17: Indigenous Knowledge Guardian Belt Recreation



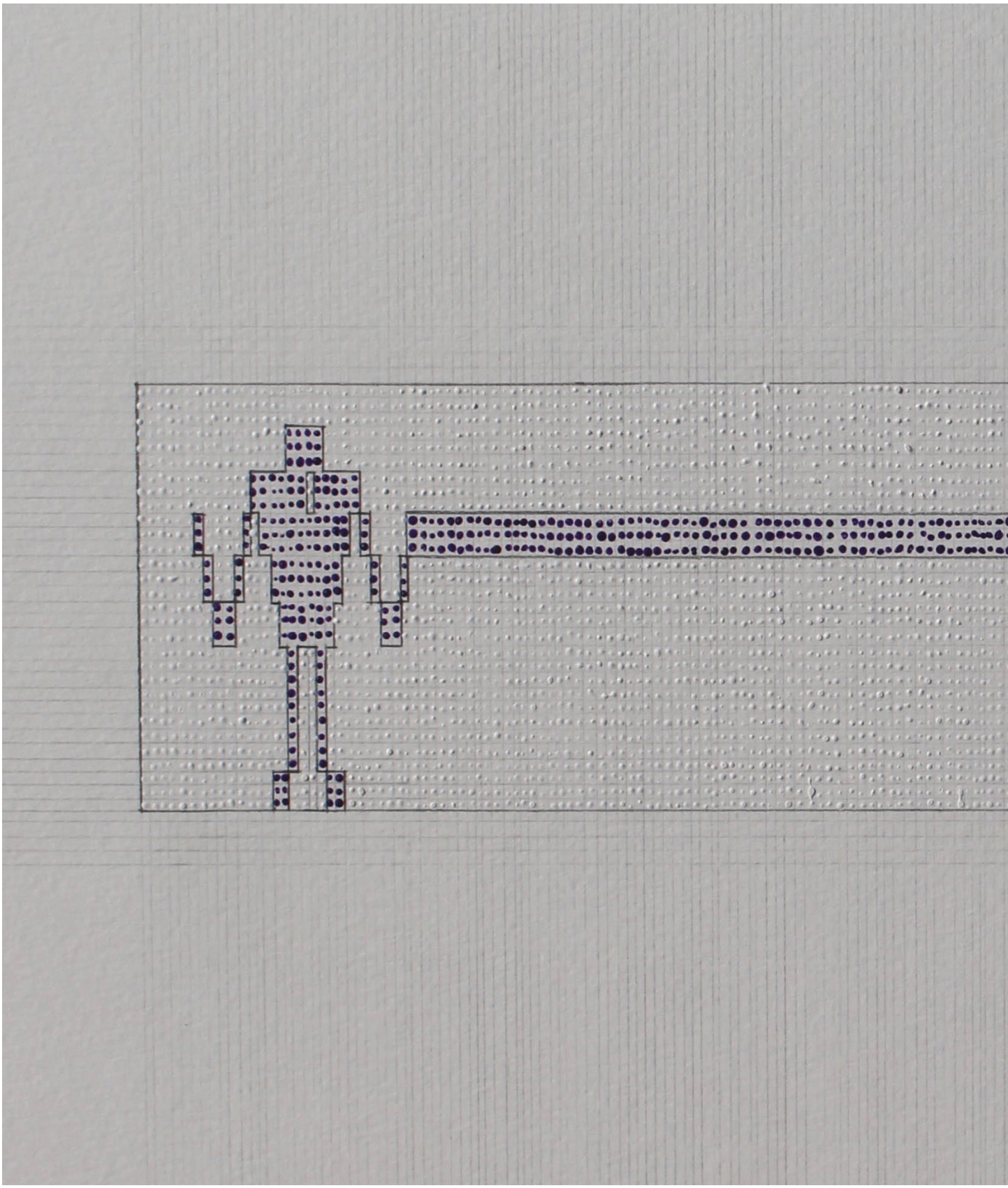
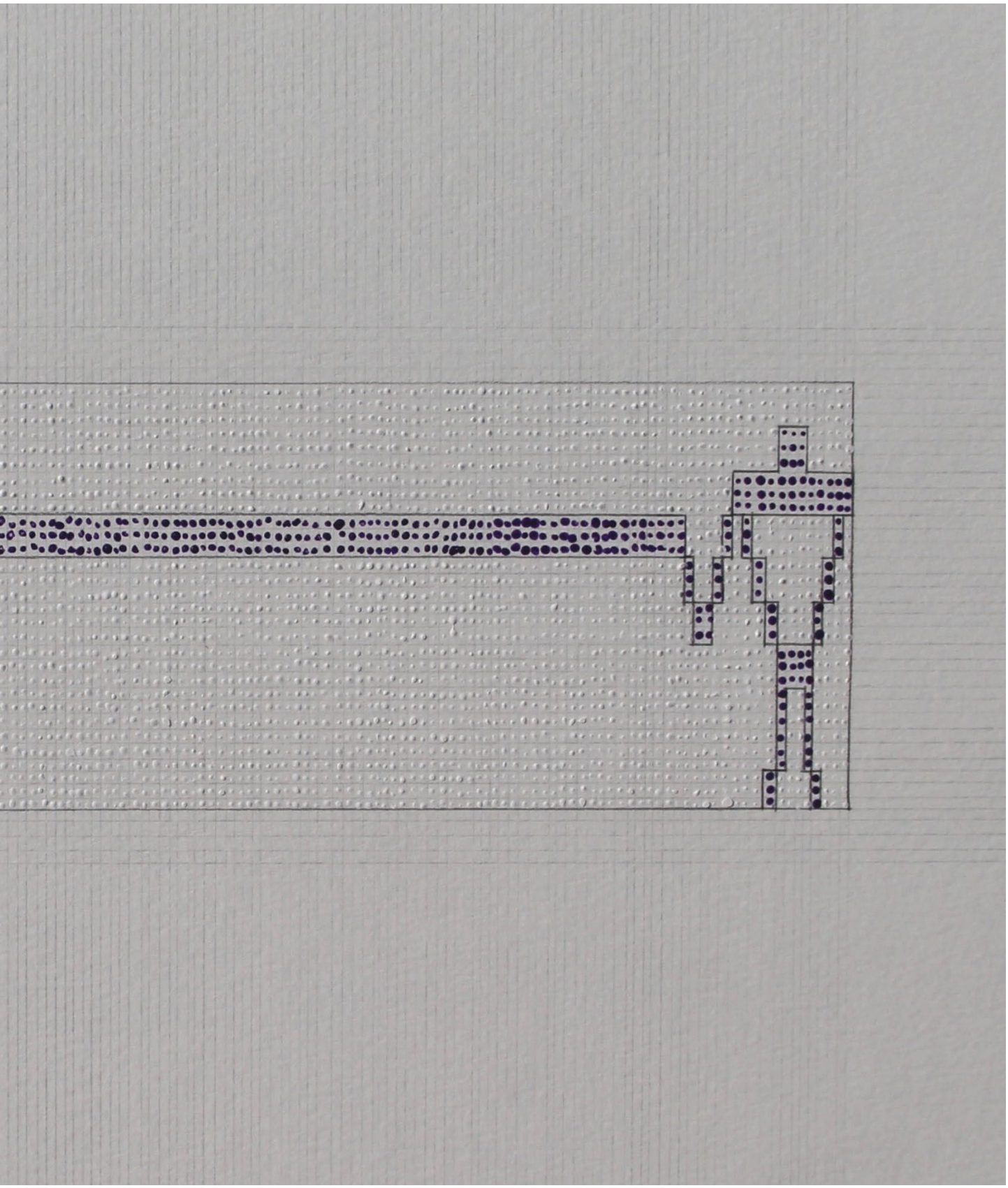


Figure 18: Covenant Chain Recreation



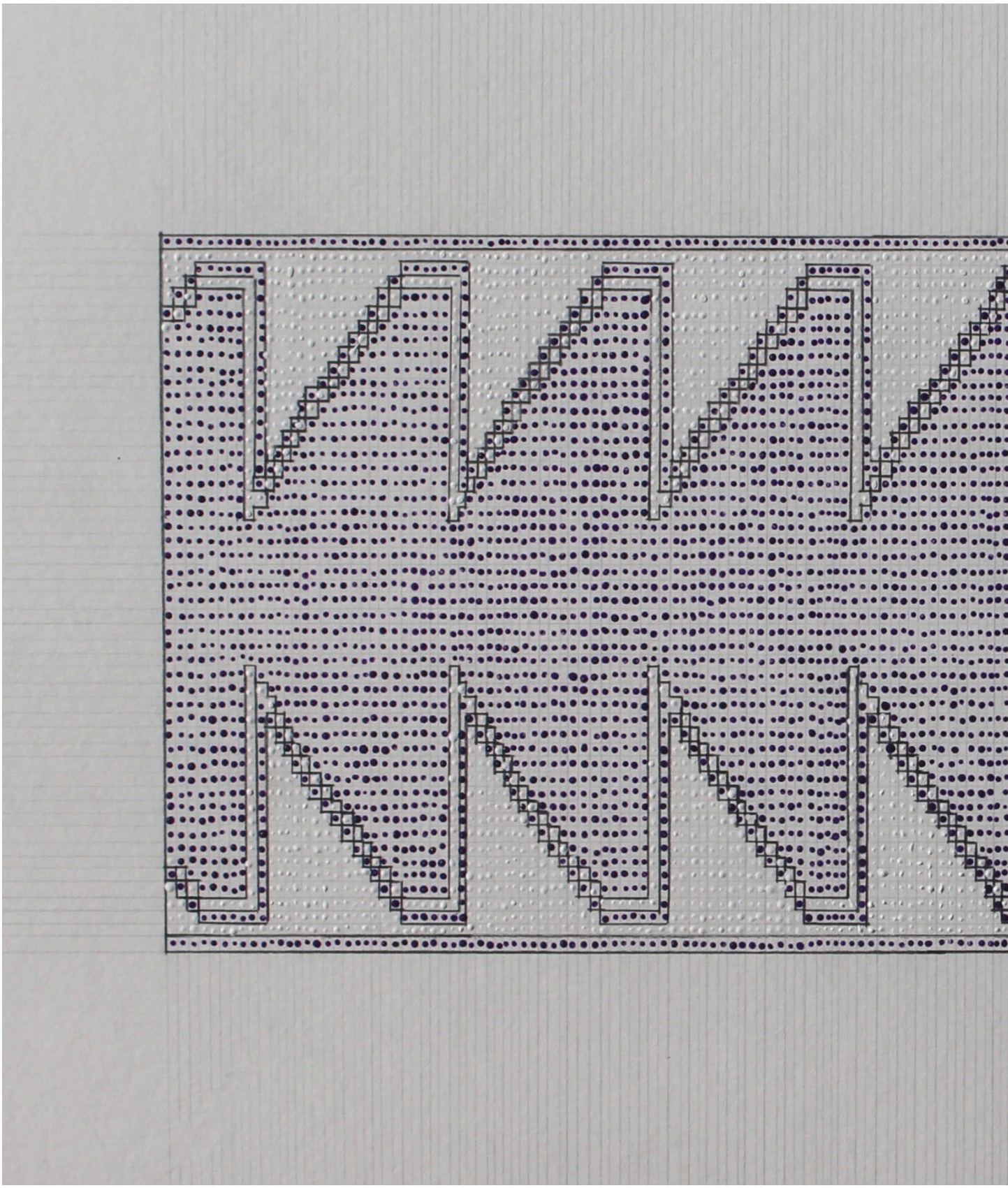
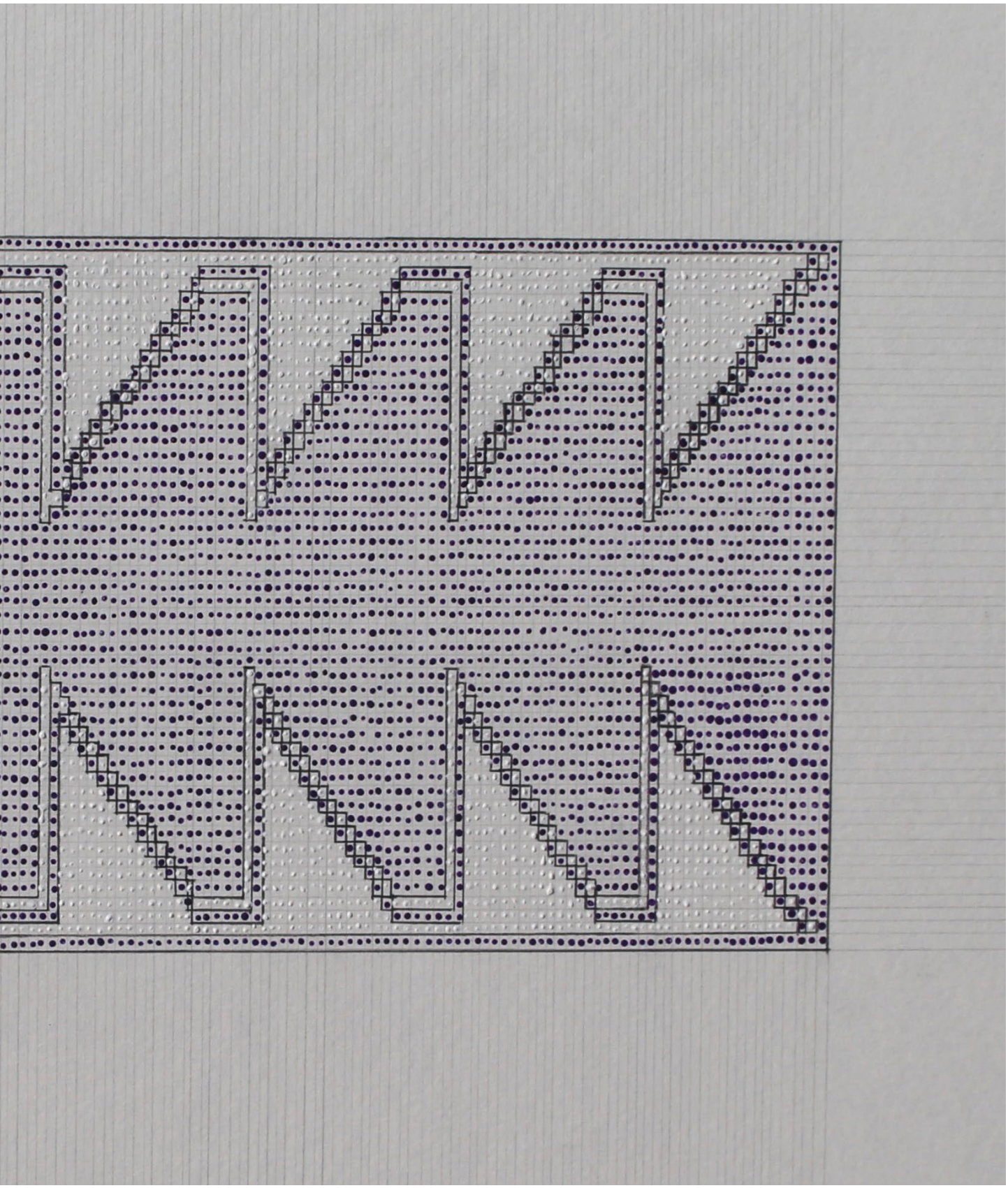


Figure 19: Evergrowing Tree Belt Recreation



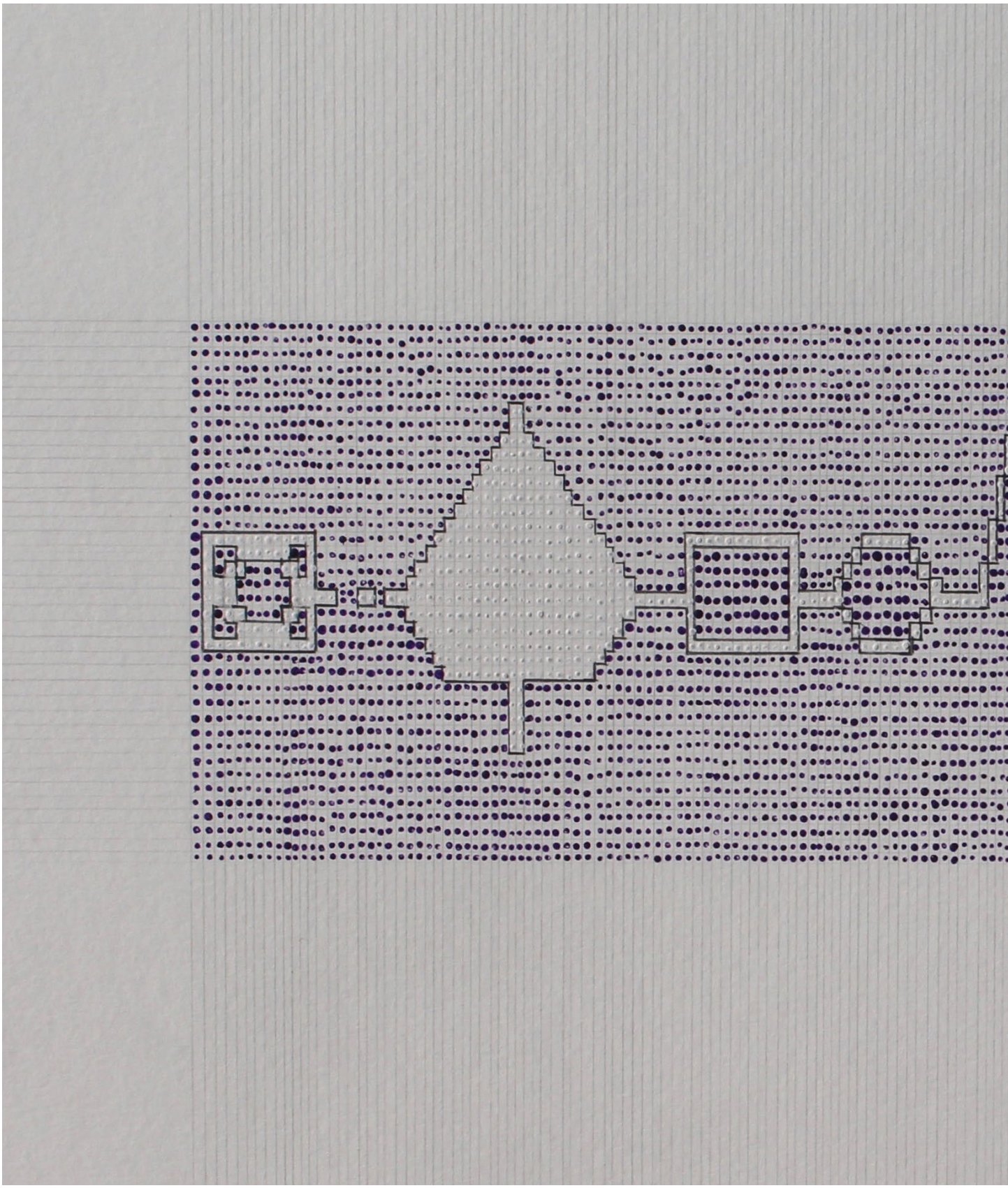
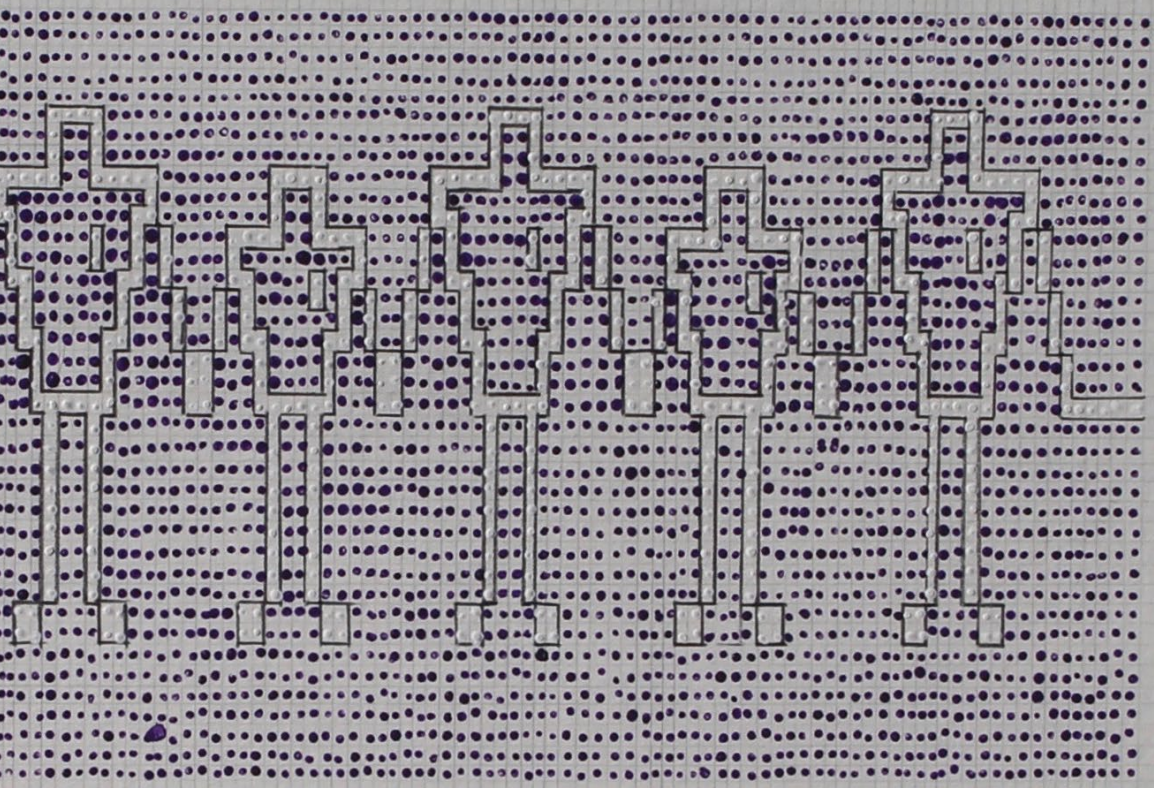


Figure 20: Inspiration Belt (Design by Author)



moving into a reconciled time period. Similarly, how peace was established out of war on previous belts.

Wampum belts have informed this thesis project by understanding how relationships and agreements were formed and communicated. In a similar way, I have designed my own creation of a wampum belt to represent my view and how it influenced the design process. If this project were to be presented to the community, this wampum belt could be presented and explained in order to show peace and build relationships.

The next steps are to draw parallels between wampum belts and my intended program. The program has the opportunity to encourage residents to be on a continuous quest for peace, alliance, and friendship, and symbolism can also be represented throughout the building to remind everyone of the good intentions presented in wampum belts historically.

Chapter 5

5 Longhouse

Haudenosaunee are matrilineal societies that historically lived in longhouses according to their clan.[55] A longhouse village was about living in harmony within a community and enforced a need to care for family and friends.[56] The location of the longhouse village was ideally on a flat hilltop to see enemies approaching. The village required access to fresh water and forests for resources to sustain the village and its people.[57] A village consisted of 30 to 150 structures and was encircled by palisades (figure 21 and figure 22).[58] Villages did not have a specific layout; buildings were instead arranged in patterns to prevent the spread of fires.[59]

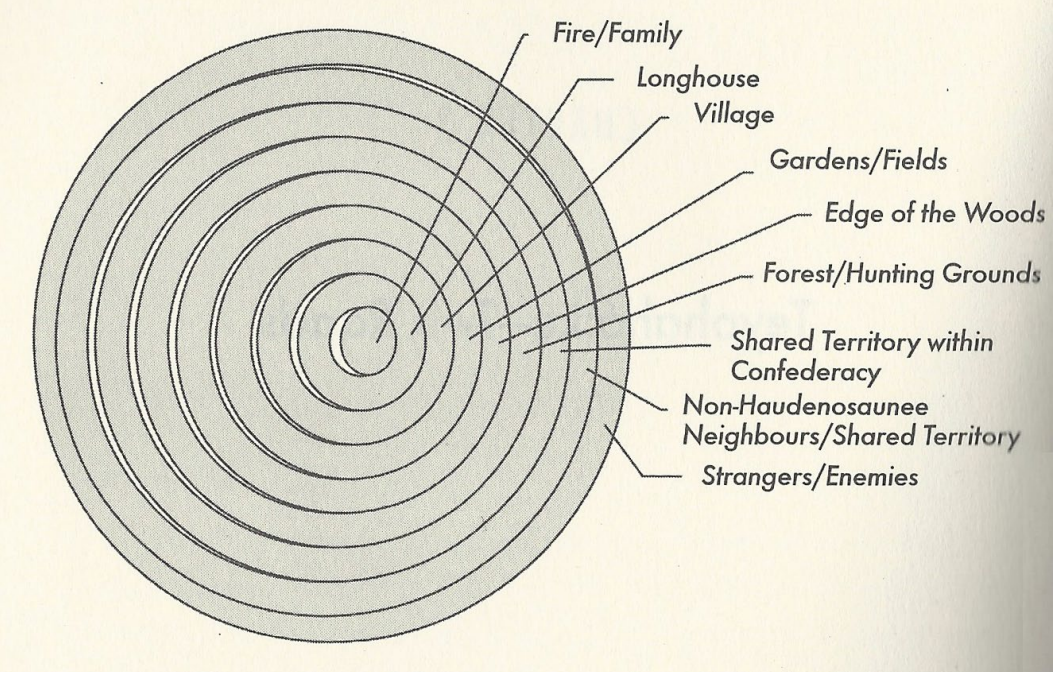


Figure 21: Susan M. Hill, H*audenosaunee Societal Spheres,* in *The Clay We Are Made Of* (Winnipeg, Manitoba: University of Manitoba Press, 2017), 80.

55 Bobbie Kalman, *Life in a Longhouse Village*. (St. Catharines, ON: Crabtree Publishing, 2001), 10.
56 Jacob Thomas and Terry Boyle, *Teachings From The Longhouse*. (Toronto, ON: Stoddart Publishing, 2013), 5-7.
57 Peter Nabokov and Robert Easton, *Native American Architecture*. (New York, New York: Oxford University Press, 1989), 76.
58 Daniel K. Richter, *The Ordeal of the Longhouse: The Peoples of the Iroquois League in the Era of European Colonization*. (Chapel Hill: University of North Carolina Press, 1992), 18.
59 Kalman, *Longhouse Village*, 7.

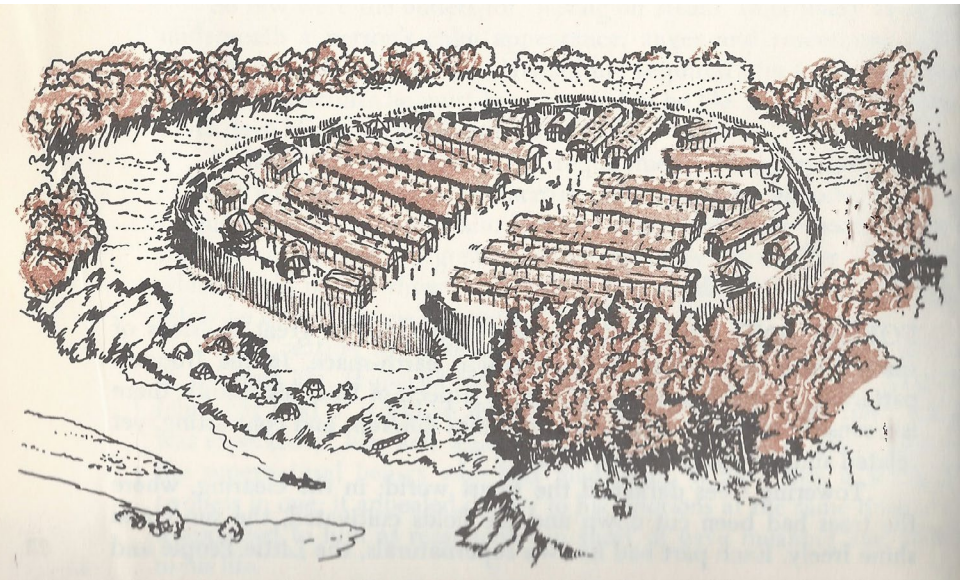


Figure 22: George Armstrong, *Longhouse Village Overview*, in *The Great Tree and the Longhouse* (New York, NY: Macmillan Company, 1966), 24.

5.1 The Function of a Longhouse

The longhouse was roughly 20 feet wide, ranged between 40 to 100 feet in length and stood 15-20 feet in height.[60] The length of the longhouse depended on the number of fires it contained, which indicated how many in-laws the family had acquired and how long it stood within the village. One fire added 20-25 feet in length to the existing structure. Each extension rested on four posts that became the base and support for the entire structure.[61] The structure of the longhouse was made out of vertical poles dug into the ground.[62] The roof was made out of bent poles and the whole structure was covered in bark; preferably elm bark, however, chestnut, hemlock, basswood, and ash have been used. To cover the structure in bark[63], it was punctured and tied to the frame with strips of green basswood or the inner elm bark. The bark was purposely overlapped and secured by using poles on the outside, creating a double layer structure. The longhouse did not have any windows and the only source of light was from the

60 Nabokov and Easton, *Native American Architecture*, 82. Also see Richter, The Ordeal of the Longhouse, 18.
61 Ibid.
62 Nabokov and Easton, *Native American Architecture*, 78.
63 The bark was typically harvested in late May until mid July. The harvested bark was flattened under rocks and was kept moist to avoid warping and cracking as it dried. Ibid., 82.

smoke holes in the roof.[64] Over the door of the longhouse hung the symbol of the clan who lived inside.[65]

Within the longhouse was one large room divided by a central corridor (figure 23), lined with support poles that extended from the floor to the roof. About 20 feet apart was a fire dug into the dirt floor shared by the families on either side. On either side were low bunks fastened to the inner exterior wall and to the support poles. The bunks were believed to have been six feet wide.[66] Woven screens were used to divide the bunks into family compartments. The bunks were private spaces and if a family desired more privacy they could hang hides in front of their bunk.[67] Below the bunks were storage for personal items[68] and pits lined with bark for dried food.[69] Above the sleeping bunks were storage shelves for items such as cornhusk mats, weapons, baskets, herbs, and dried tobacco. The rafters of the longhouse were used to hang food to dry.[70]

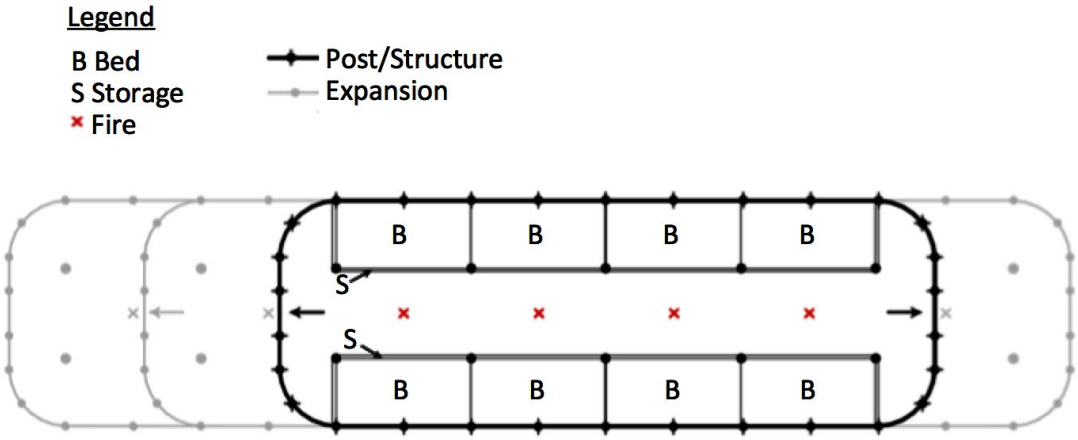


Figure 23: Plan of Longhouse Extension

64 Ibid., 82-83.
65 Kalman, *Longhouse Village,* 10.
66 Nabokov and Easton, *Native American Architecture*, 84.
67 Kalman, *Longhouse Village*, 7.
68 Nabokov and Easton, *Native American Architecture*, 84.
69 Kalman, *Longhouse Village*, 7.
70 Nabokov and Easton, *Native American Architecture*, 84.

Longhouses have informed this thesis project by becoming the basis for a multi-generational housing project. The longhouse was an adaptable structure as it had the ability to expand to accommodate the growth of a family. It brought family together but also the community, it created an environment where people came together and depended on each other. My design is inspired by these concepts.

Chapter 6

6 Evolution of the Community

Haudenosaunee have been displaced in the past. Today, many Haudenosaunee reside in Southern Ontario, on the Six Nations of the Grand River reserve. On the reserve there is a village, which became the location where most services are located. After investigating the services offered, the community plan, and consulting my grandparents[71], I selected a site located outside of the village. Taking into consideration the historical displacement, selecting a site and creating a sense of ownership became critical throughout this process, which I felt this was not achievable within the limited space of Ohsweken.

6.1 Haldimand Treaty

Historically, the Haudenosaunee resided between the Hudson River Valley to the east, and the Great Lakes to the west; known today as New York State (figure 24).[72] Borders and boundaries did not exist, Indigenous people referred to use rights, living as neighbours where each nation had a land base (figure 25). Each nation had their unique identity[73] and responsibilities.[74]

71 My grandparents, Roland and Melba Martin, advised me to go outside of Ohsweken as it is rapidly growing and overcrowded with the services already offered in the area.

72 Six Nations Council, Six Miles Deep: *Land Rights of the Six Nations of the Grand River,* (Ohsweken, ON: Six Nations Council, 2015), 3, http://www.sixnations.ca/SixMilesDeepBooklet2015Final.pdf.

73 Seneca (Onondowahgah) means "People of the Great Mountain", Cayuga (Guyohkohnyoh) means "Great Pipe People", .onondaganationga (Onundagono) means "People of the Hills", Oneida (Onayotekaono) means "Standing Stone People", Mohawk (Kanien'kehaka) means "People of the Flint", and lastly, Tuscarora (Sharuhreh) means "People of the Shirt." *HaudenosauneeTeachings* shared by my late Aunt Lisa Martin prior to 2006.

74 The Mohawk nation was responsible for protecting and defending the eastern boundary of the Haudenosaunee territory, they were known as the "Keepers of the Eastern Door". The Seneca nation was responsible for protecting and defending the western boundary of the Haudenosaunee territory, they were known as the "Keepers of the Western Door." The Onondaga nation was centre of the Haudenosaunee territory therefore the fire burns here, they are known as the "Keepers of the Central Fire." As mentioned by National Museum of the American Indian Education Office, *Haudenosaunee Guide for Educators*, (Washington, D.C: National Museum of the American Indian, 2009), 1, https://americanindian.si.edu/sites/1/files/pdf/education/HaudenosauneeGuide.pdf.

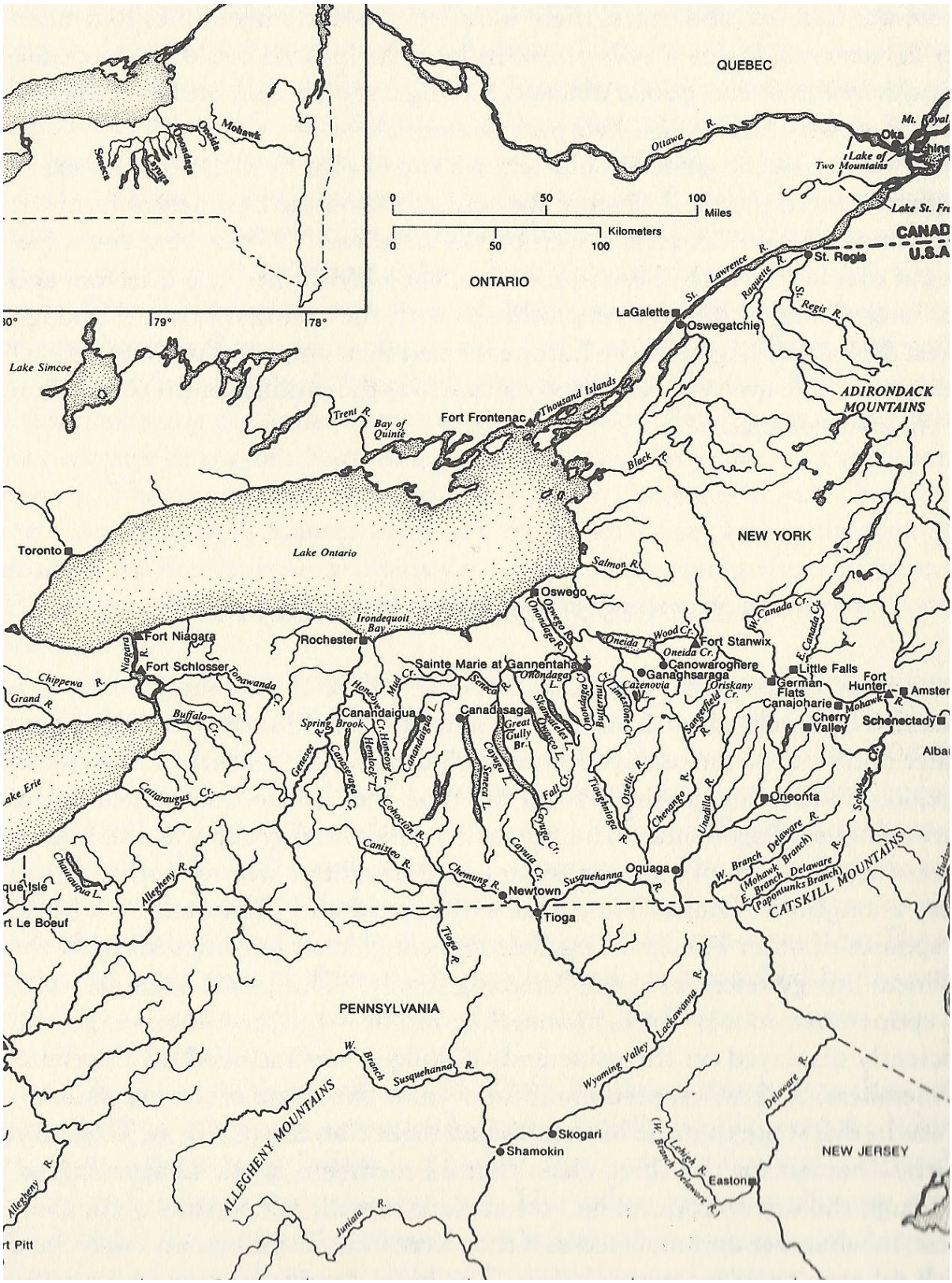


Figure 24: Francis Jennings, William N. Fenton, Mary A. Druke, and David R. Miller. *17th/18th Century Map of Haudenosaunee Territory,* in *The History and Culture of Iroquois Diplomacy* (Syracuse, NY: Syracuse University Press, 1985), 8.

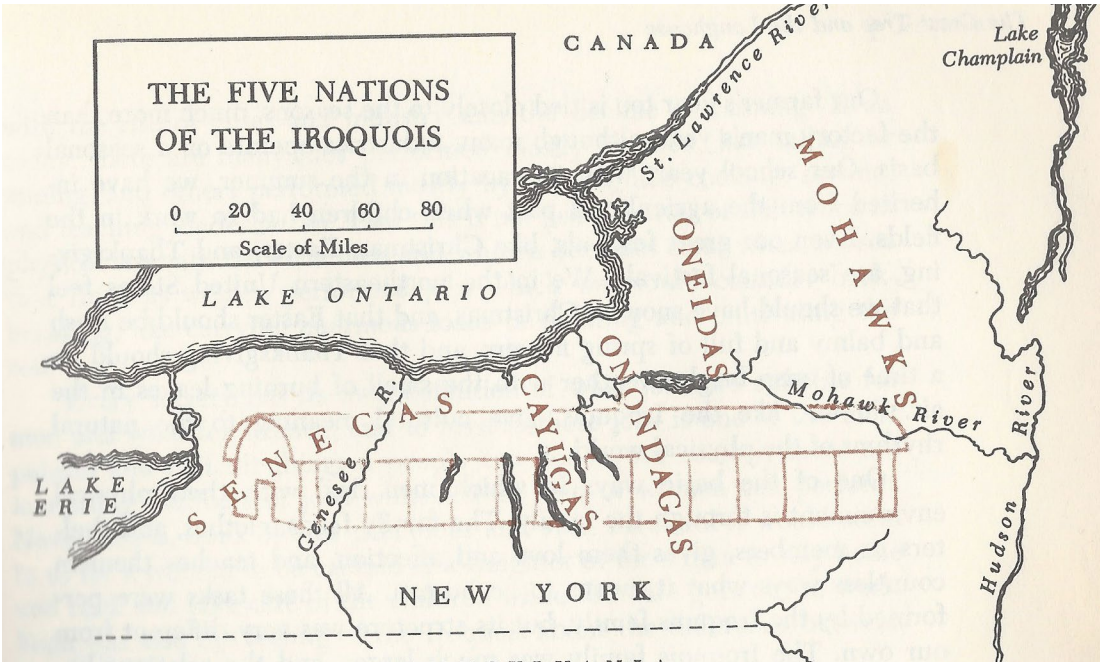


Figure 25: George Armstrong, *Enlarged Map of Haudenosaunee Territory*, in *The Great Tree and the Longhouse* (New York: NY: Macmillan Company, 1966.

A divide in the Haudenosaunee occurred during the American War of Independence, as many Haudenosaunee allied with the British and moved into Upper Canada. Great Britain and the United States of America later established boundaries; this is also when treaties were negotiated. The treaties were compensating for lands previously lost, and as an award for the role played as an ally in the war. The Haldimand Treaty signed in 1784, designated approximately 950,000 acres of land in Southern Ontario to the Haudenosaunee.[75]

The Haldimand Treaty included six miles on both sides of the Grand River from Lake Erie to the head of the river. The reserve is known as Six Nations of the Grand River. The land was to be held in trust by the Crown for the sole use and benefit of Six Nations, however the Crown failed to uphold the deal. Ten years after the treaty approximately 275,000 acres were removed, and in the following 40 years, 90% of the land was removed. Today, the Six Nations of the Grand River reserve is less than five percent of the original land base granted back in 1784 (figure 26).[76]

75 Six Nations Council, *Six Miles Deep*: 3-4.
76 Ibid., 4-5.

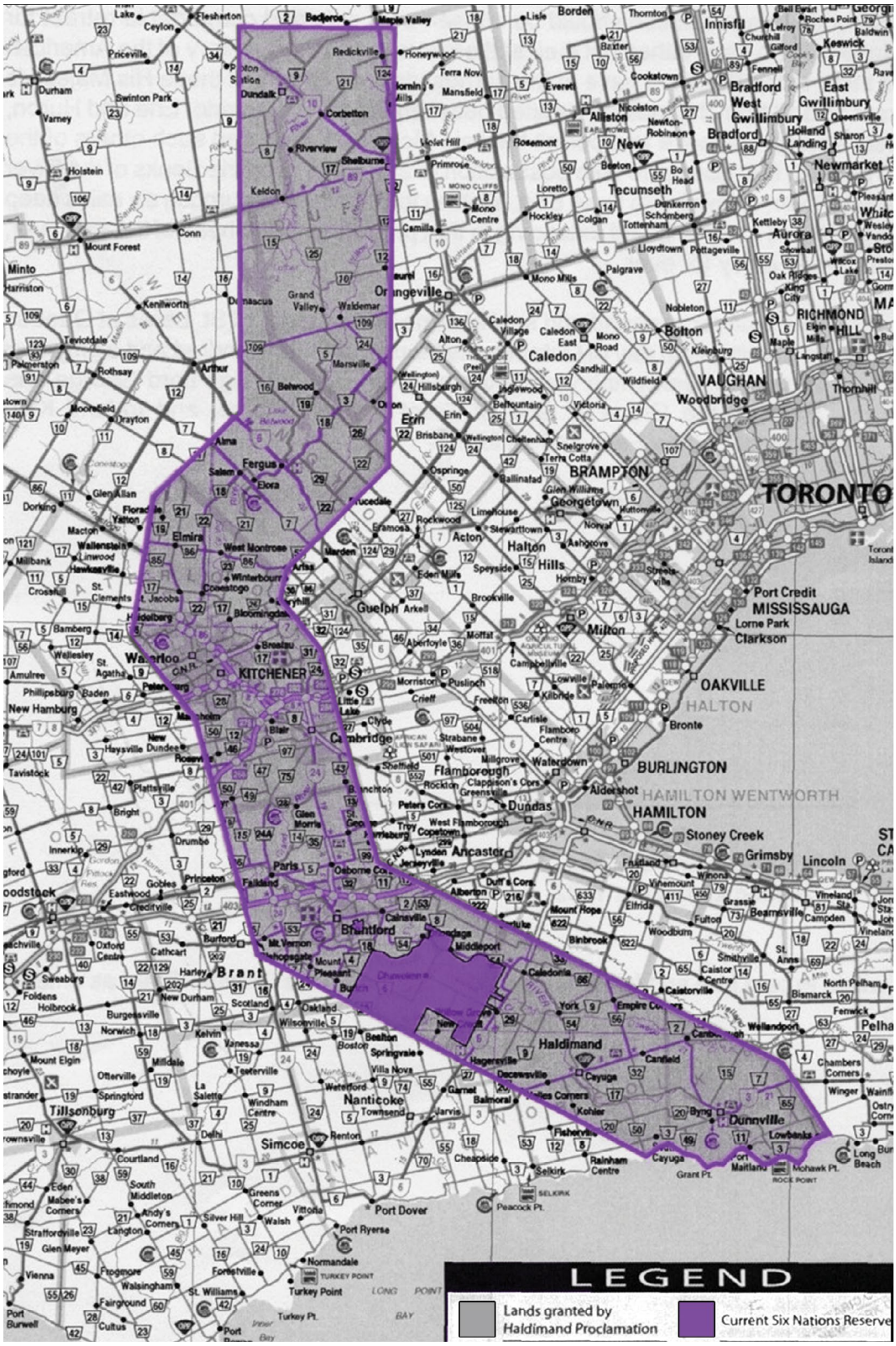


Figure 26: Six Nations. *Haldimand Treaty Land Mass.* Digital image. Six Nations Lands Department.http://www.sixnations.ca/LCMap.pdf

6.2 The Village - Ohsweken

In the middle of Six Nations of the Grand River is the village, Ohsweken. Ohsweken is rapidly growing and contains services, such as government and administration,[77] along with residential housing. Six Nations has 13 departments.[78] I have identified 24 services through visiting and observing services offered (figure 27 and figure 28).

Family members who live on Six Nations shared stories on how fast Ohsweken has developed and the rapid growth no one in the community expected. Despite this being the ideal location for any new building, it was wise to consider sites outside of the village. Taking this advice into consideration and after mapping out the services already offered, I have selected a site along 4th Line, on the edge of Ohsweken across from Six Nations Police (figure 27).

6.3 Community Observations

Six Nations of the Grand River has a Community Plan Team, which focuses on capturing the voices of the community to understand the visions, values, and goals of the Six Nations. The main goal of the team is to intertwine narratives to best express who they are as a community and as a people. The secondary goal is to gather feedback to share with departments and organizations to collaboratively reach community goals.[79] The community's voice was heard through questionnaires, dot-charts, speakers' corners, conversations, and focus groups.[80] "*As a community, we all have a responsibility to create a better life for ourselves, and our future generations. The Six Nations Community Plan is merely a tool, to guide us in that direction.*"[81] The Community Plan is currently in the midst of being updated, this is essential as the last plan

77 Ibid., 7.
78 The departments are Economic Development, Finance Department, Fire Department and Fire Halls, Housing Department, Human Resources Department, Information Technology, Lands and Membership Department, Lands and Resources Department, Six Nations of the Grand River Ontario Works, Six Nations Public Works, Six Nations Health, and Social Services Department.
79 Six Nations of the Grand River Development Corporation, *Six Nations Community Plan*, Six Nations of the Grand River Development Corporation, http://sndevcorp.ca/about-community-plan/.
80 Six Nations Community Planning, *Six Nations Community Plan: 2018 Progress Update,* Six Nations of the Grand River Development Corporation, August 2018, 3, http://sndevcorp.ca/wp-content/uploads/2018/08/Six-Nations-Community-Plan-2018-Progress-Update.pdf.
81 Six Nations Community Planning, *Six Nations Community Plan*, 3.

was updated in 2010 and many visions, values, and goals could have changed. The community plan was broken down into seven sections: Mother Earth, Built Environment, Employment and Education, Economic Development, Community, Well-Being, and Arts and Culture.

Figure 27: Key Map of Ohsweken

Figure 28: Enlarged Map of Ohsweken

The community has expressed concern about a shortage of community land. The built environment has roughly 2808 housing units. 2413 housing units are rural and 395 are suburban. According to the Capital Assets Inventory System, 275 houses are in need of a major renovation and 84 need to be fully replaced. Six Nations has a housing loan program which has been

operating since 1968, however due to the large population not all housing needs are met in the community leaving a shortage of 1200 homes. The community plan has continued to provide rural housing opportunities, for example by creating 50 homes on 4th Line that would address community housing needs being met.[82]

In addition to housing being a demand, there is also a demand for a child and youth centre along with a space for Elders. The child and youth centre is a place to encourage Six Nations youth to flourish, the Elders' space is a place to gather and socialize.[83] As updated in the 2018 Community Plan, this need has been addressed by creating a connection between the Gaylord Powless Arena and the Six Nations Community Hall.[84]

The demographic cycle (figure 29) reinforces the needs of the community. As of December 2017, the largest population age group on reserve was ages 20 to 24 with 1108 people, closely behind are ages 25 to 29 with 1031 people and ages 15 to 19 with 1012 people. In contrast to the younger population, there is also an aging population on reserve, with 2137 people aged 60 years or older.[85]

82 Six Nations Community Planning, *Six Nations Community Plan,* 9-12, and *Six Nations Community Plan: 2018 Progress Update*, Six Nations of the Grand River Development Corporation, August 2018, 11-14, http://sndevcorp.ca/wp-content/uploads/2018/08/Six-Nations-Community-Plan-2018-Progress-Update.pdf.
83 Six Nations Community Planning, *Six Nations Community Plan*, 27.
84 Six Nations Community Planning, *Six Nations Community Plan: 2018 Progress Update*, 30.
85 Six Nations Lands/Membership Department, *Community Profile-Population,* (Six Nations of the Grand River. http://www.sixnations.ca/CommunityProfile.htm.

Age - Years	Male			Female			Total On Reserve	Total Off Reserve	Total Member - ship
	On Reserve	Off Reserve	Total Male	On Reserve	Off Reserve	Total Female			
0 - 4 yrs.	366	126	492	361	103	464	727	229	956
5 yrs - 9 yrs	480	272	752	436	253	689	916	525	1,441
10 yrs - 14 yrs	450	335	785	463	332	795	913	667	1,580
15 yrs - 19 yrs	535	397	932	477	384	861	1,012	781	1,793
20 yrs - 24 yrs	543	483	1,026	565	521	1,086	1,108	1,004	2,112
25 yrs - 29 yrs	535	541	1,076	496	575	1,071	1,031	1,116	2,147
30 yrs - 34 yrs	518	513	1,031	428	503	931	946	1,016	1,962
35 yrs - 39 yrs	444	454	898	443	530	973	887	984	1,871
40 yrs - 44 yrs	424	469	893	323	480	803	747	949	1,696
45 yrs - 49 yrs	372	539	911	341	548	889	713	1,087	1,800
50 yrs - 54 yrs	454	532	986	415	610	1,025	869	1,142	2,011
55 yrs - 59 yrs	385	513	898	457	586	1,043	842	1,099	1,941
60 yrs - 64 yrs	346	383	729	424	595	1,019	770	978	1,748
65 yrs - 69 yrs	236	321	557	298	452	750	534	773	1,307
70 yrs - 74 yrs	135	227	362	193	365	558	328	592	920
75 yrs - 79 yrs	88	164	252	122	302	424	210	466	676
80 yrs - 84 yrs	57	132	189	85	217	302	142	349	491
85 yrs plus	64	212	276	89	459	548	153	671	824
TOTAL	**6,432**	**6,613**	**13,045**	**6,416**	**7,815**	**14,231**	**12,848**	**14,428**	**27,276**

Figure 29: Six Nations. *Six Nations Demographics Chart, 2017*. Digital image. Six Nations. http://www.sixnations.ca/CommunityProfile.htm.

6.4 Significance of History and Context to Design

The history and current observations of Six Nations of the Grand River has informed this thesis project by allowing me to understand how the community has been impacted historically and has given me the opportunity to understand the visions, values, and goals of the community today. From the above findings, Six Nations is rapidly growing and housing is already a focus for the community. As identified, providing housing along 4th Line is already in the community plan and my selected site has the opportunity to address this vision. Even though the youth and Elder centre has been addressed, my design will encompass teachings from the Haudenosaunee longhouse and create multi-purpose spaces where the residents have the ability to support one another.

Part 2: Design

Chapter 7

7 Architectural Interventions

The significant teachings from the wampum belts and the Haudenosaunee longhouse have become a design framework that go beyond the physical appearance; instead, these teachings can complement the community as it continues to grow by incorporating traditional teachings. As mentioned earlier, the community lacks housing and buildings for community gatherings. Reflecting how a community would have supported each other in a traditional longhouse village, and by analyzing the community plans and the demographics, I propose a multi-generational housing complex with a communal space along the main road, 4th Line, to best suit the community and their needs.

7.1 Initial Design Ideas

The site selected is an open field that is fairly flat (figure 30). Surrounding the site is a company called Native Stone on the northeast, a field to the east, community housing to the southeast, Six Nation Police to the south, and a single family dwelling to the west (figure 31). Upon further research, Six Nations Lands/Membership Department indicated that the selected site consists of several properties (figure 32); for the purpose of the project, the site is being treated as one large site instead of multiple smaller ones.

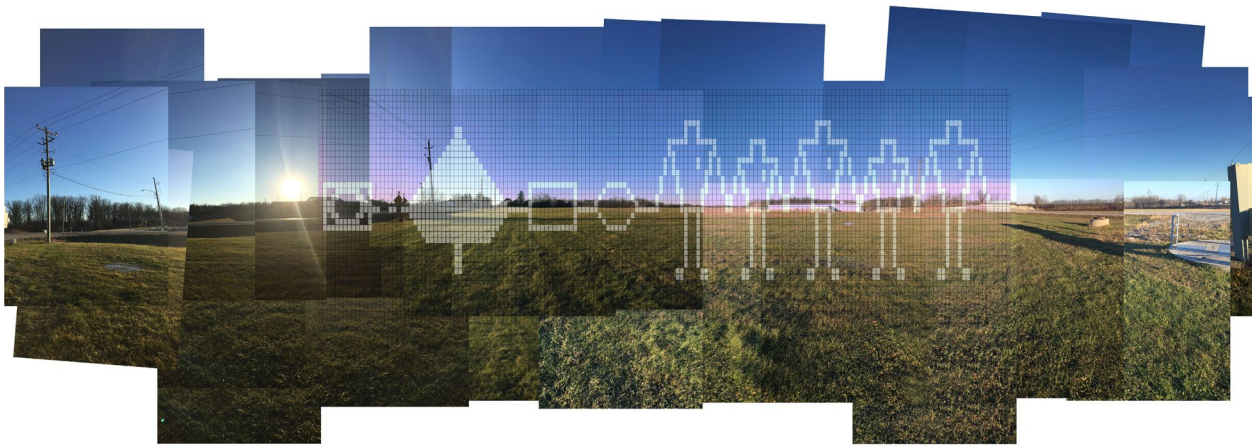


Figure 30: Collage of Site

Figure 31: Site Surroundings

Figure 32: Site with Individual Property Lines

The design project has the ability to expand in order to address the increasing demand for housing. The idea behind the expansion is to encourage families to grow in place and to create a space where the community can support one another. The notion of supporting each other means that children, adults, and Elders can be supported through intergenerational ties; similar to how the pre-contact longhouse became one large extended family who supported each other within the longhouse and longhouse village. Drawn to the southeast corner of the site, because the driveway for Native Stone meets the main roadway, 4th Line, I began by putting all my initial thoughts on paper (figure 33).

Each design included an expansion plan and attempted to address the corner where the roadways meet. The first three designs were inspired by wampum belt concepts, and the longhouse village inspired the last two. The selected design was option five, as this successfully addressed the existing roadways, and reflected the longhouse village layout (figure 34). The initial design contained a pitched roof to reflect a typical residence (figure 35), however this design needs further exploration to move away from an institutional image and bring character to the elevations.

The design of the communal spaces can be similar to the shared fire from the traditional longhouse teachings, where resources and cooking facilities could be shared to maximize personal spaces in private units. The design will encourage residents to be on a continuous path towards peace, alliance, and friendship as taught through the wampum belts. For example, the Hiawatha Belt has inspired the entire program and function of the building by being able to expand and adapt to the demands of the community as well as creating a space where nations can live in unity under one roof. The Two Row Wampum Belt signifies two vessels being separate but connected traveling down the river. This can translate into architectural spaces to accommodate multiple functions simultaneously. The Dish with One Spoon Belt could inspire a communal kitchen for the community to gather and prepare food together that can be shared among all residents, as the teachings from the belt are about equal sharing of wild game and peace among all people. A gathering room or dining hall could be inspired from the Indigenous Knowledge Guardian Belt, as this can be a safe space for oral teachings to be shared and protected. The Covenant Chain Belt could represent the housing units to symbolize an everlasting peace, which can be made among the residents and their neighbours. Lastly, symbolism honouring the wampum

belts can be represented throughout the building to remind everyone of the good intentions when the wampum belts were made.

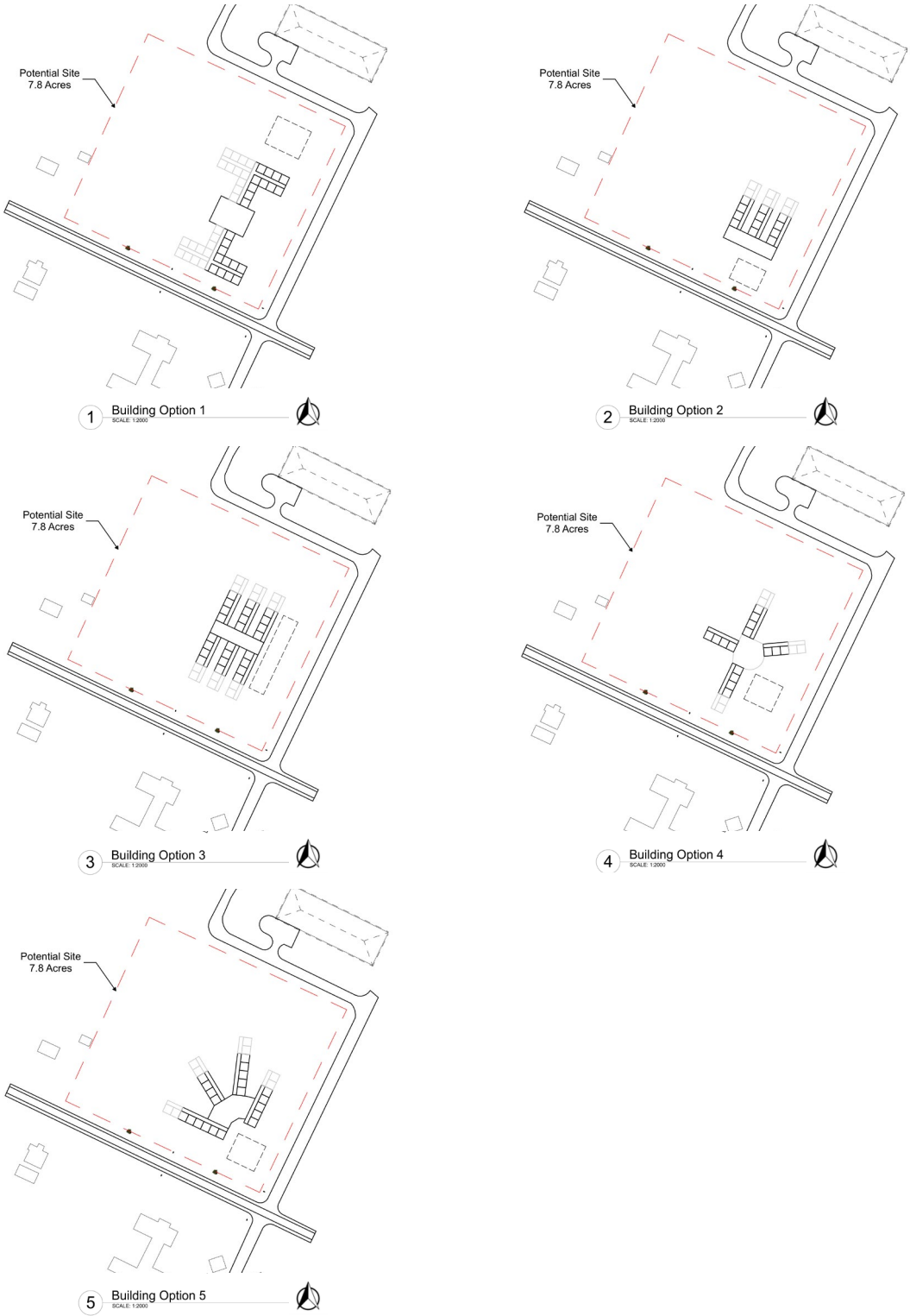


Figure 33: Building Layout Options (Option 5 is the one chosen to develop)

Figure 34: Building Floor Plan

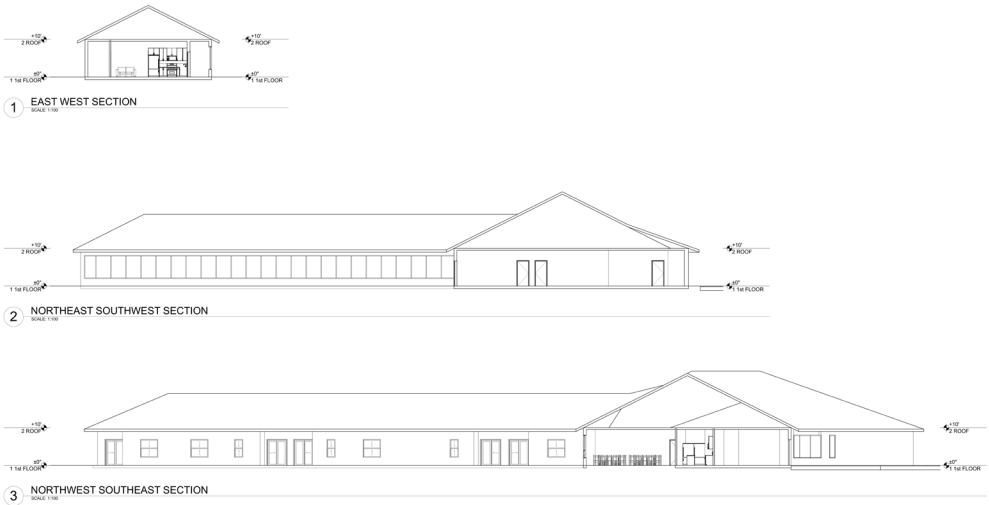


Figure 35: Building Sections

In a traditional longhouse village, activities occurred inside the structures but also outside on the land, within the palisades and beyond. Community gardens are an opportunity to bring traditional lifestyles to the 21st century. The gardens can grow food to support the housing and cut costs on fresh produce for the residents. An outdoor area for cleaning game and stretching hides can create a community teaching centre where traditional teachings can be shared and taught in a similar way to how it would have been taught to younger children in the longhouse village.

7.2 Site Analysis

I analyzed the selected site to understand how the environmental conditions would interact with the design. Through a wind study (figure 36), I learned the prevailing winds are from the southwest. However, the wind shifts in March to the west-northwest, in April the winds shift to the east-northeast, and in August, September, and December it shifts to south-southwest.[86] The sun study revealed during the summer solstice at noon, the altitude of the sun is 64.07° meaning for every meter in height a shadow of 0.49 meters will be cast (figure 37). Whereas for the winter solstice at noon the altitude of the sun is 23.40° meaning for every meter in height a shadow of 2.31 meters will be cast (figure 38).[87] These shadows are critical to understand to inform the exterior courtyards. The environmental data analyzed informs where activities are proposed and how landscaping can be used to inform a micro-climate if the natural conditions are not favourable.

86 Windfinder.com. *Wind Statistic Brantford Airport*, Windfinder, https://www.windfinder.com/windstatistics/brantford-municipal-airport.
87 Torsten Hoffmann, *SunCalc Sun Position*, Sun Calc, January 30, 2019, https://www.suncalc.org/#/43.0634,-80.1014,18.540925297332745/2019.06.21/22:22/1/1.

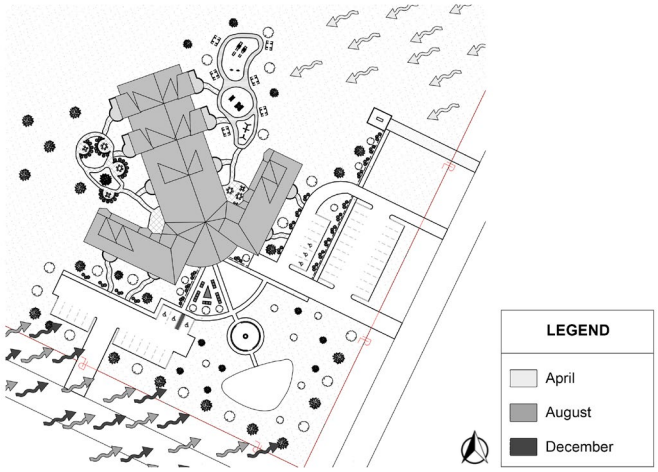


Figure 36: Wind Study

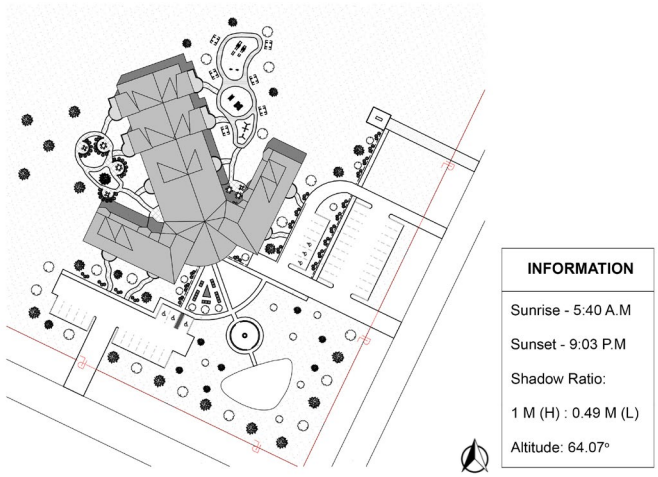


Figure 37: Summer Solstice at Noon

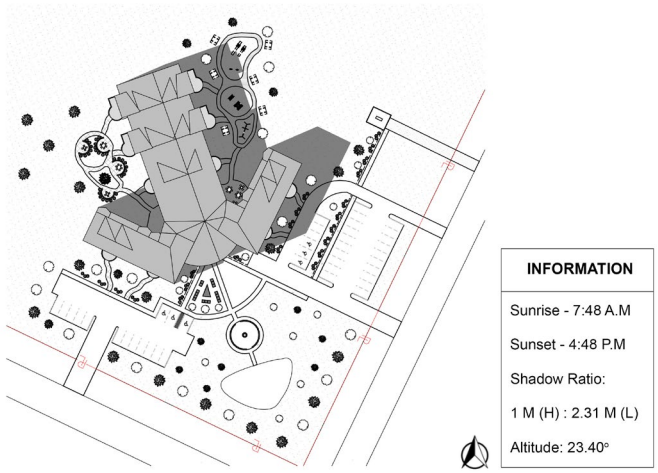


Figure 38: Winter Solstice at Noon

7.3 Site Plan Development

Based on the site analysis, the first iteration of the site plan (figure 39) shows how the programing can extend beyond the walls of the proposed building. I am proposing an exterior skinning area (figure 40) where knowledge about hunting and harvesting game could be taught. The skinning area is proposed on the northeast side, as the majority of the year the wind will not carry any smells towards the other proposed areas. A community vegetable garden (figure 41 and figure 42) provides a place for knowledge about gardening to be passed on to younger generations and to also allow the community to work together and encourage sharing food amongst one another. The garden is proposed on the south side of the building to maximum sun exposure. The outdoor patio area (figure 43) is proposed on the northeast as an extension to the dining hall that can be used during the summer months where there is protection from direct winds and shade is provided from the building shadow. An elongated playground (figure 44, figure 45, and figure 46) for the younger residents to enjoy the outdoors and gives a designated safe area to run, slide, climb and swing. The playground is proposed on the northeast side of the building, as it is the furthest from the main roadway, and a shadow will cast during the summer offering guardians watching their children play relief from direct sunlight. Lastly, a garden and sitting area (figure 47 and figure 48) is designed for mature residents who enjoy being outside surrounded by native plants. The garden and sitting area is separated from where children could be playing by one of the building wings to reduce noise transfer. This courtyard is proposed on the west side of the building and will be exposed to more sunlight all year round, however landscaping can be implemented to create a micro-climate.

Figure 39: First Iteration of Site Plan Design

Figure 40: Enlarged Skinning Area

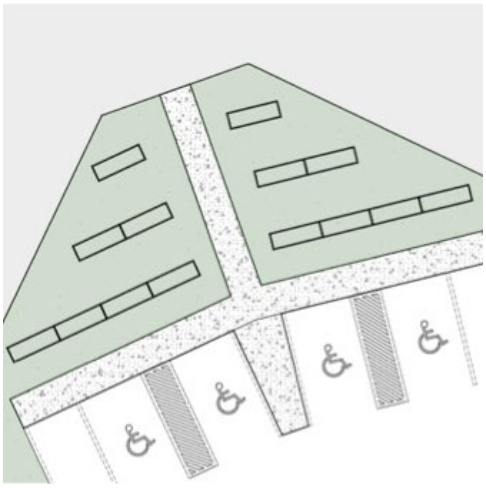


Figure 41: First Iteration of Community Vegetable Garden Design

Figure 42: Collage of Community Vegetable Garden

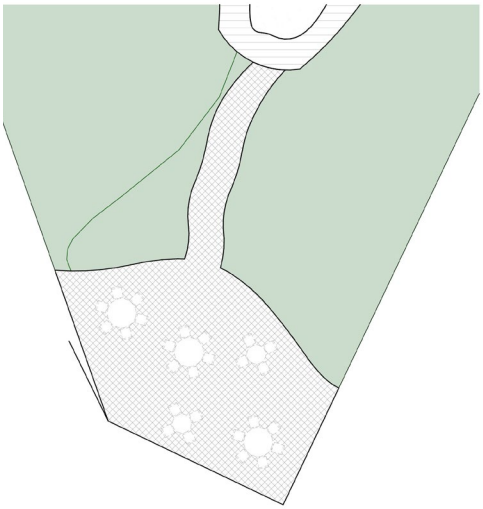


Figure 43: First Iteration of Patio Area Design

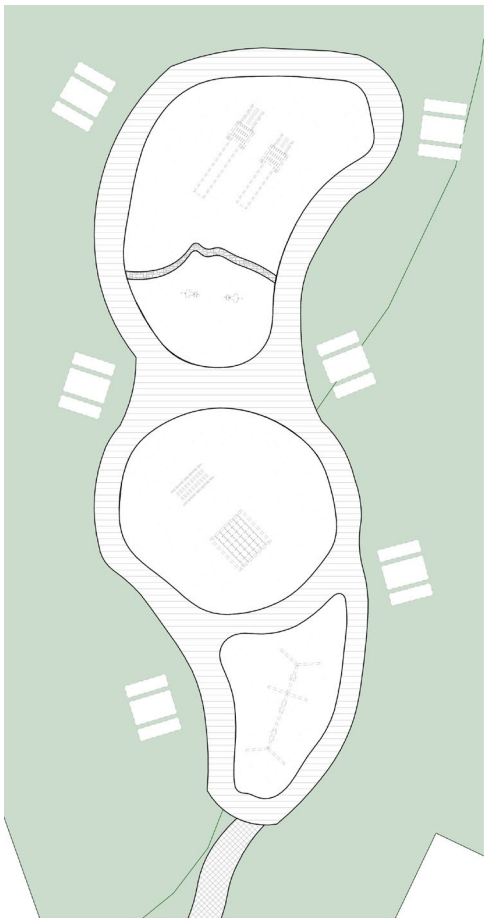


Figure 44: Enlarged Playground Design

Figure 45: Collage of Playground 1

Figure 46: Collage of Playground 2

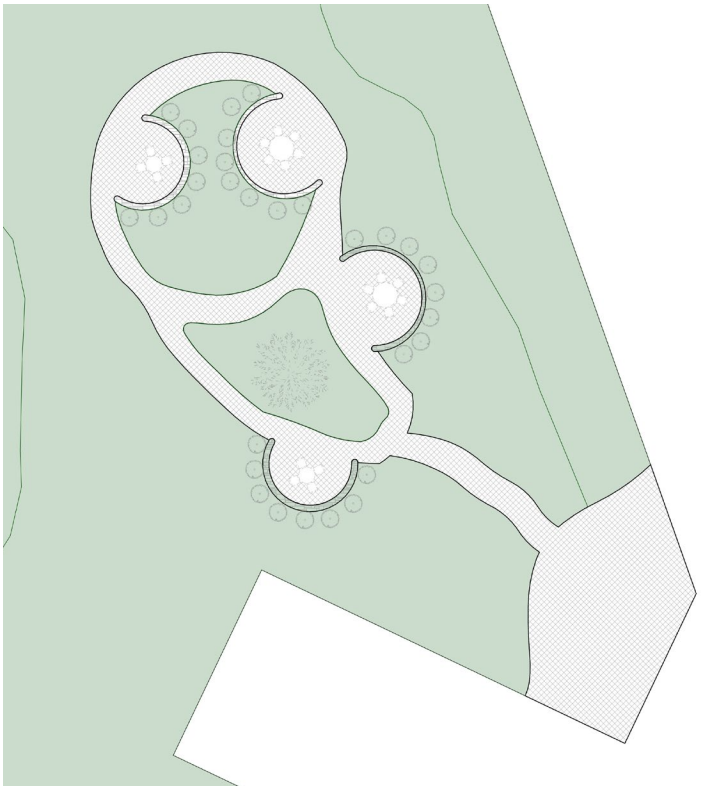


Figure 47: Enlarged Garden/Sitting Area

Figure 48: Collage of Garden/Sitting Area

The second iteration of the site plan (figure 49) resulted in changes to the exterior program. Modifications to the plan included a newly designed community vegetable garden and patio area. Added later to the plan was a community fire pit and a pond with fish and a water feature for the summer months that can transform into a skating rink in the winter. The second iteration of the vegetable garden (figure 50) is pulled away from the building and becomes a greeting place. The garden is larger than before, and comprises raised garden beds along with in-ground planting area, offering more opportunity to grow vegetables and herbs. Between the raised garden beds are gravel walkways for multiple ways to enter and wonder through the garden (figure 51). The patio (figure 52) was rearranged to respond to the changes of the interior program. An exterior fire pit (figure 53) was added, to bring the community together. The fire pit can be used for social events, a place where food can be cooked over an open fire, or even a place where teachings about fire can be taught, similar to how a longhouse village would have used the fire pit to sustain the longhouse. The site pools water on the southeast corner, therefore to optimize the issue of water and incorporate it into the design I am proposing a retention pond (figure 54). The pond can become a feature emphasizing a social hub in front of the building; families can fish or visit around the pond and be calmed by the sound of water from the water feature which will counteract the sound of traffic. During the winter months, the community can use it as an outdoor skating rink.

In this iteration, a canopy was added to the front entrance as a feature. The peak of the canopy is an expansion of the central roof, therefore the two roof planes are at different heights; this continues a very strong line through the building. The peak appears to be off centre but in plan it points directly to the fire pit (figure 55). The column supports are small to make the canopy appear light; under the canopy I propose a walkway with greenery (figure 51).

The second iteration of the canopy began to consider larger members and the potential for programing below (figure 56). Exterior benches have been added to allow a place for residents to sit and socialize, using the covered canopy as a front porch and to watch the front courtyard.

Figure 49: Second Iteration of Site Plan Design

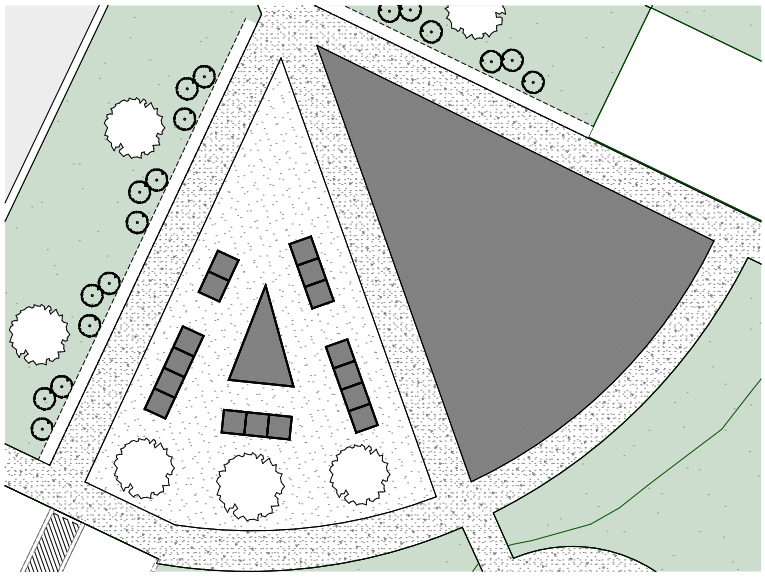


Figure 50: Second Iteration of Community Vegetable Garden Design

Figure 51: Digital Collage of Second Iteration of Community Vegetable and Canopy Design

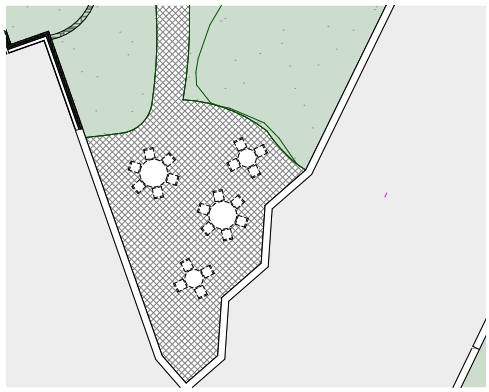


Figure 52: Section Iteration of Patio Area Design

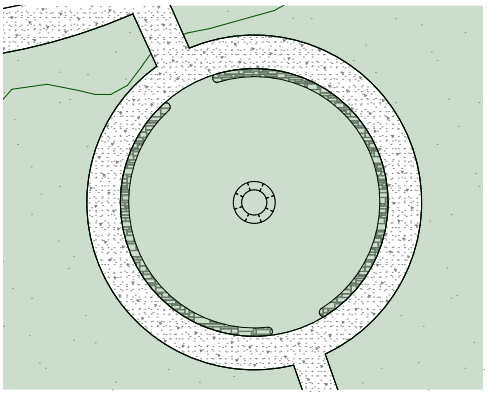


Figure 53: Community Fire Pit Area Design

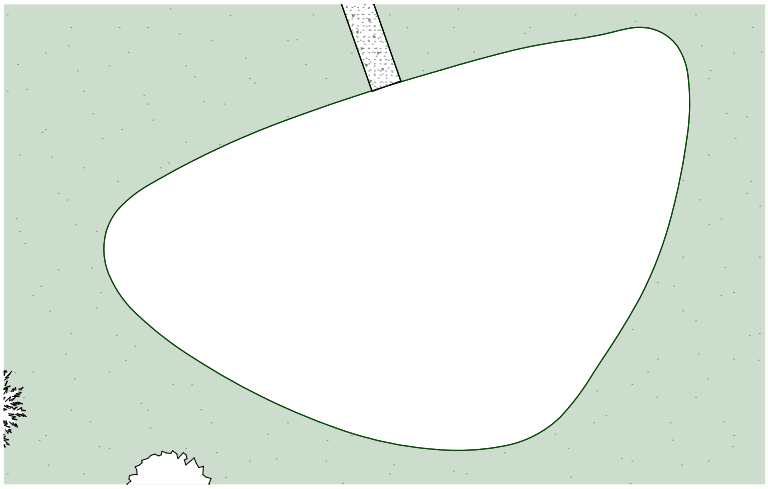


Figure 54: Retention Pond Design

Figure 55: Diagram of Canopy and Connection to Fire Pit

Figure 56: Digital Collage of Second Iteration Under Canopy

The third iteration of the canopy is larger and curved (figure 57). The curved shape of the canopy is a connection to the curved pathway (figure 58 and figure 59). By increasing the amount of covered area the front porch idea is enhanced, as there is more potential for programming. Exterior benches, tables, and chairs allow for a place for residents to sit and socialize while being protected from the elements (figure 59). The canopy integrates a clerestory for natural lighting which points towards the fire pit, reinforcing strong line through the building (figure 60).

Figure 57: Third Iteration of Canopy in Plan

Figure 58: Third Iteration of Canopy in Plan

Figure 59: Digital Collage of Third Iteration Under Canopy

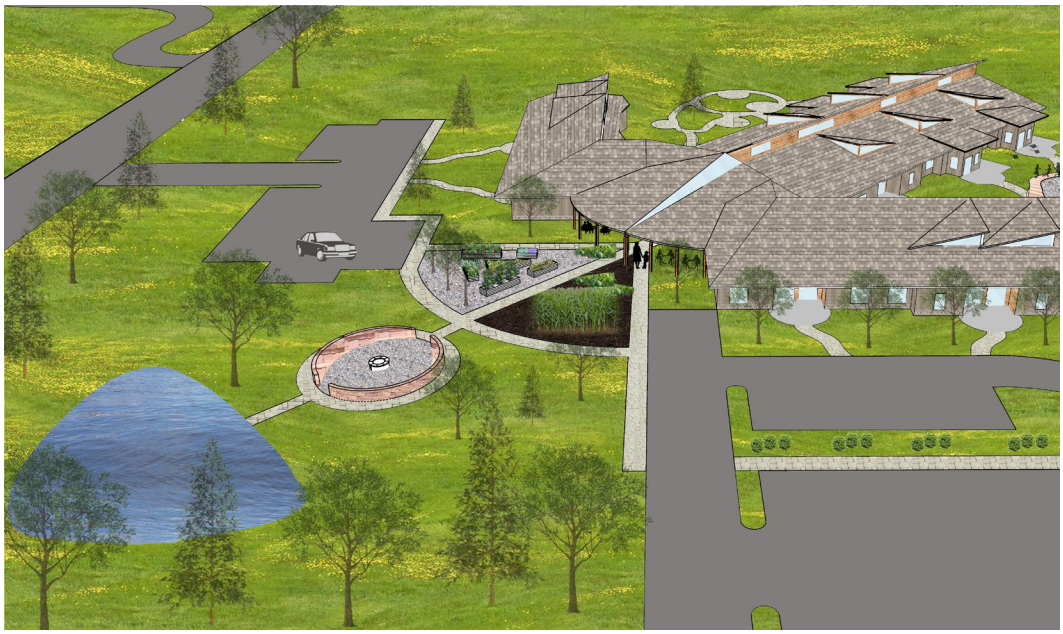


Figure 60: Digital Collage of Third Iteration Canopy and Connection to Courtyard

7.4 Overall Floor Plan Development

As the exterior program was modified, the interior program was also developed. In all iterations of the design, the communal spaces were designed to encourage residents to be on a continuous quest for peace, alliance, and friendship as taught through the wampum belts. The design of the building is to accommodate different personalities by having public and private spaces designed for comfort (figure 61, figure 62, and figure 63).

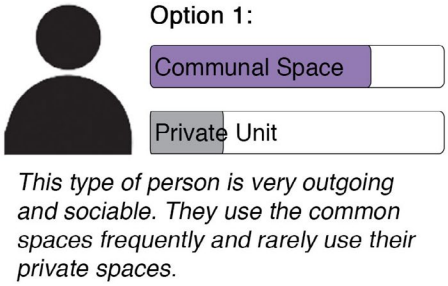


Figure 61: Option 1 Usage of Spaces

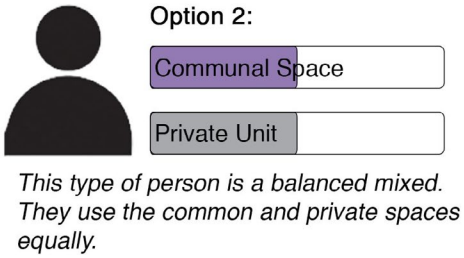


Figure 62: Option 2 Usage of Spaces

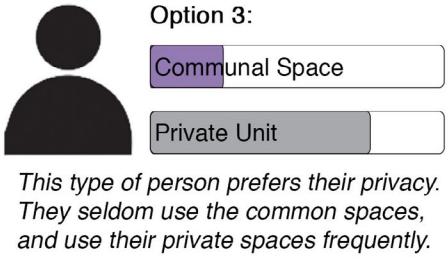


Figure 63: Option 3 Usage of Spaces

The first iteration of the floor plan (figure 64) combined two wings together to reflect a longhouse. When the two central wings were combined together they created a double-loaded corridor with individual units on either side and the two outer wings each resemble half of a longhouse. This design allows for the building to expand (shown as dashed lines in figure 60), details on how these expansions could work have not been resolved within this iteration. These expansions reflect teachings from the longhouse as the family grew, so did the longhouse. In this case, as the community grows, so does the building. Early on in the design process I placed the kitchen in the centre of the floor plan to resemble the fire within a longhouse.

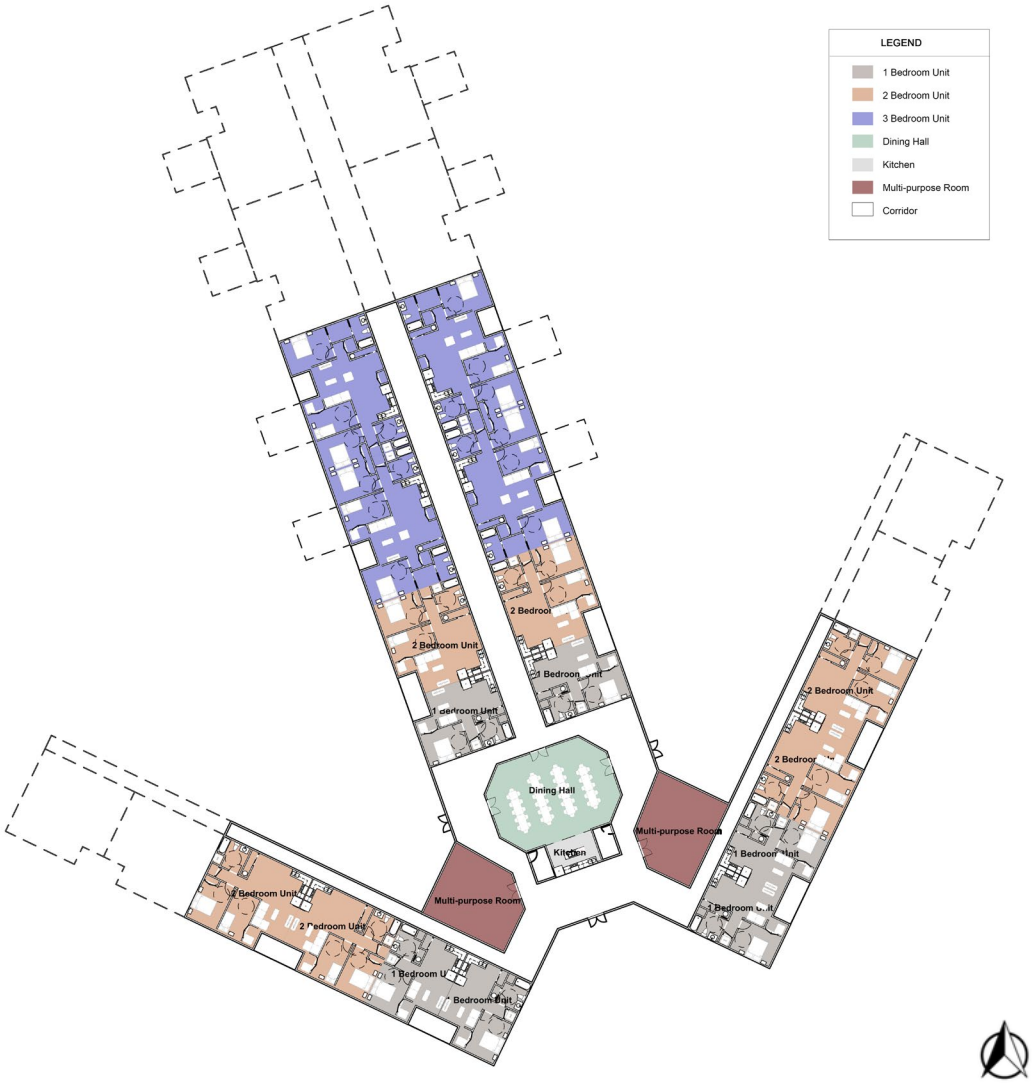


Figure 64: First Iteration of Floor Plan and Expansion Design

The second iteration of the floor plan (figure 66) broke the straight edges from the previous iteration, and reorganized the common areas in the centre of the building. This iteration focused on how the design could expand. Firstly, more units can be added to all three wings (shown as dashed lines in figure 66), without interfering with the exterior program. Secondly, the three bedroom units can add an additional bedroom with minor renovations to the existing building (figure 65). The idea behind the expansion is to allow families to provide a space for a young adult who may be living with them or for an elderly family member whom can no longer live on their own, reflecting the notion that the community has the potential to grow. The central area was reorganized to have the multi-purpose rooms connected to the kitchen and dining hall, allowing for any event to have the ability to be catered, emphasizing the importance of food within Indigenous culture.

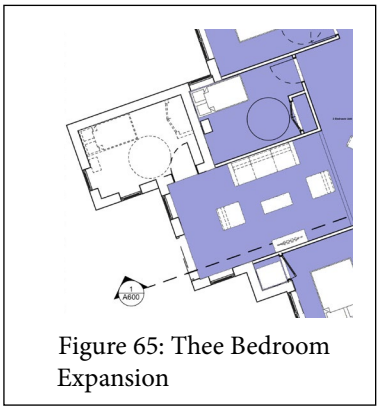


Figure 65: Thee Bedroom Expansion

Figure 66: Second Iteration of Floor Plan Showing Expansion Capability

The third iteration of the floor plan (figure 67) reconfigured the central space while still incorporating the ability to expand. The footprint of the building was oversized in the second iteration, resulting in the central space forming awkward spaces, oversized hallways, and extra space without a designated program assigned. In analyzing the program intentions it was determined the entire floor plan of the building could be shrunk to resolve the awkwardness of the floor plan. The kitchen remained in the centre to resemble the shared fire of a longhouse, and the dining hall opens up off of the kitchen, to emphasize the importance of food within Indigenous culture and to allow for the people cooking to be seen and to socialize with other people who are in the dining hall.

Figure 67: Third Iteration of Floor Plan

7.5 Individual Spaces Development

Every space within the building was designed with teachings and concepts learned from the Haudenosaunee longhouse and wampum belts. The design intention was to create each space to be welcoming and to incorporate natural elements (wood or plants) whenever possible. Spaces were designed with the intention residents will respect one another's space and each other.

As the building is entered, there is an informal lobby (figure 68). To embrace the Haudenosaunee culture, I am proposing a feature wall across the kitchen and dinning room to showcase local artists. The wall has the potential to showcase wampum belts, clans, and the six Haudenosaunee languages in order to spark conversation about teachings and the culture. As the building is entered, there is a view through the building because of the open concept design. The beams from the dining hall can be seen above with the feature wall and down the double-loaded corridor. Within the lobby space, chairs and tables are being proposed, for residents to sit and enjoy the space.

Figure 68: Digital Collage of Informal Lobby Design

The first iteration of the dining hall shape was inspired by the Indigenous Guardian Belt's geometry (figure 69), as the outline of this belt represents protection of the Indigenous culture and traditions, meaning the dining hall is a place to gather, share knowledge and everyone's

intentions are good. The idea was to have windows wrapping the dining hall walls to allow natural light to filter into the space. Wood beams are to bring the notion of warmth and plants to bring another element of home into the space (figure 70). The idea is to encourage the community to work together to maintain the living elements incorporated into the design. The double-loaded corridor roof design has been expanded into the dining hall to allow natural light to enter from above.

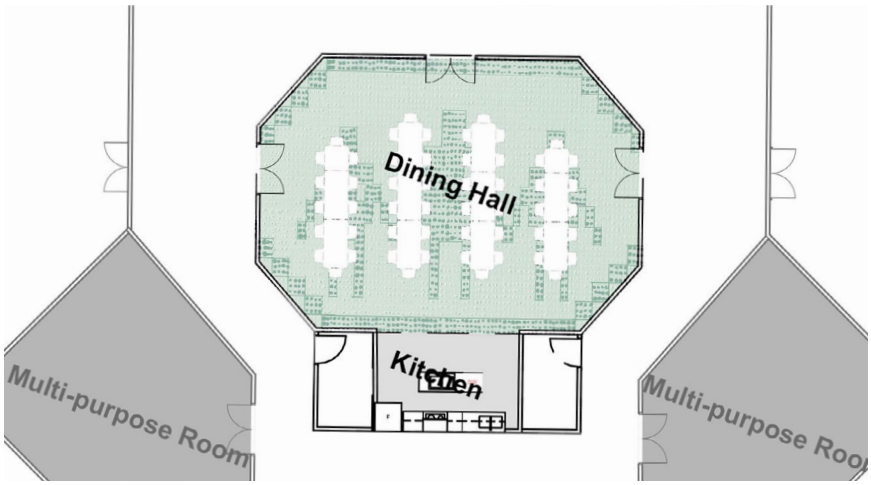


Figure 69: First Iteration of Dining Hall Plan

Figure 70: Collage of First Iteration Dining Hall

The second iteration (figure 71) of the dining hall captured the design intentions from the first iteration, however the dining hall was relocated to the edge of the building, allowing for direct access to the outside, where the potential to expand outside to a patio area that can be used during the summer months.

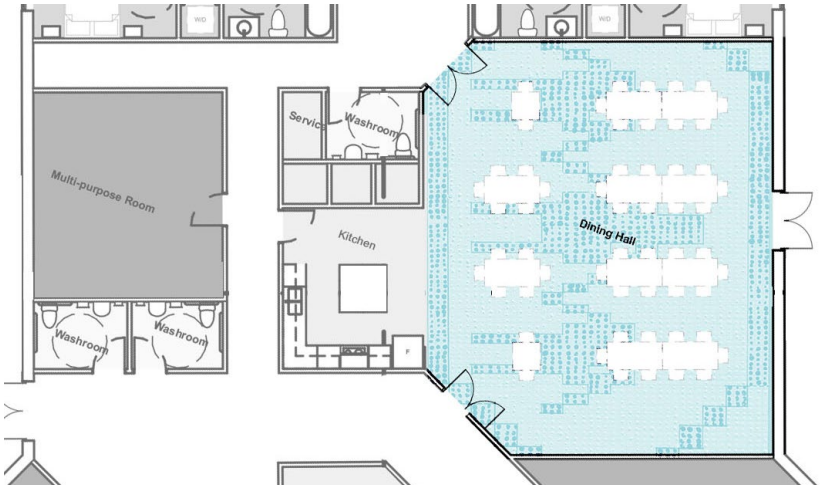


Figure 71: Second Iteration of Dining Hall Plan

The third iteration of the dining hall (figure 72) kept all design elements from the second iteration, and enhanced the idea of sightlines and connections throughout the building. Windows were added to the south wall and the northwest wall to allow the space to be more open and inclusive, while also providing the opportunity for residents passing by to see what is happening in the space. Additionally, the walls of the dining hall are partial height walls to allow for an acoustic connection between the spaces.

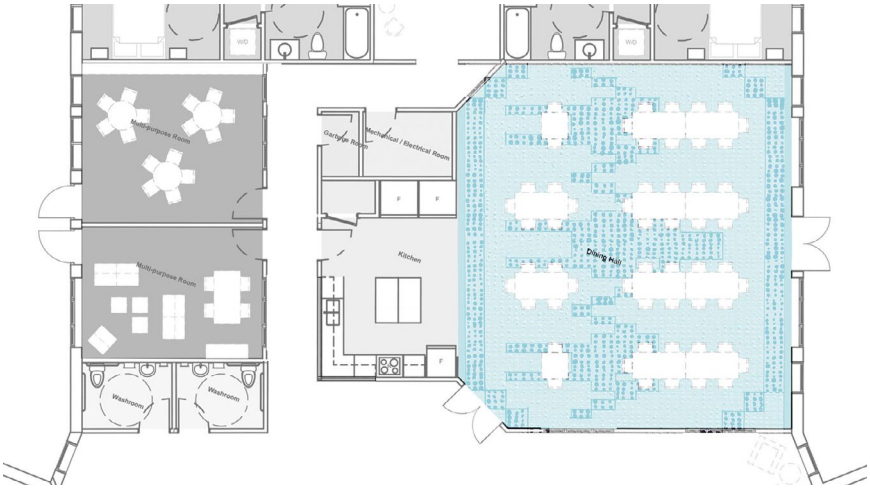


Figure 72: Third Iteration of Dining Hall Plan

The Dish with One Spoon Belt inspired the first iteration of the kitchen (figure 73). The teaching from this belt reflects food and equal sharing among people. Therefore the intent of the communal kitchen is to provide a space for the residents to come together to support one another and encourage socializing around food, as experienced in the culture.

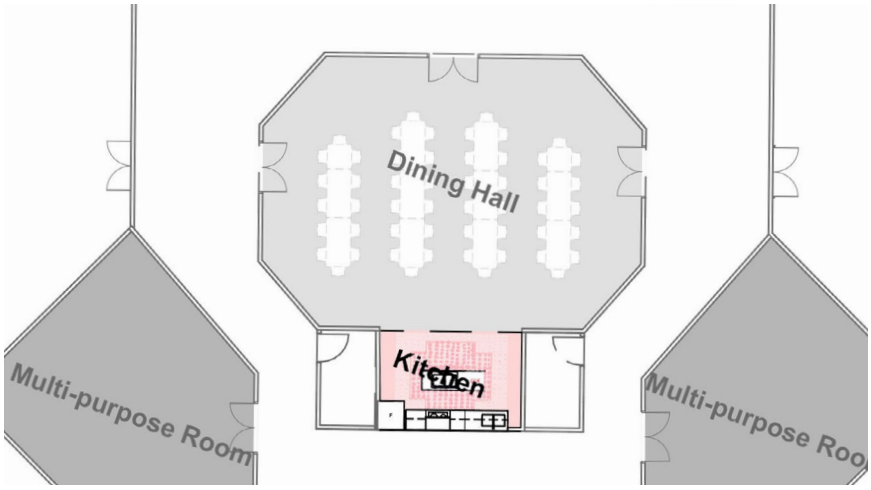


Figure 73: First Iteration of Kitchen Plan

The second iteration of the kitchen (figure 74) was reorganized to incorporate more counter space for preparing food, a walk-in fridge and freezer, along with a small room for dry food storage. The kitchen opens onto the dining hall to be more inclusive while allowing people preparing food to have a view to the outdoors. The intent with this iteration was to provide a space to socialize and prepare food, while still being able to have a view outside.

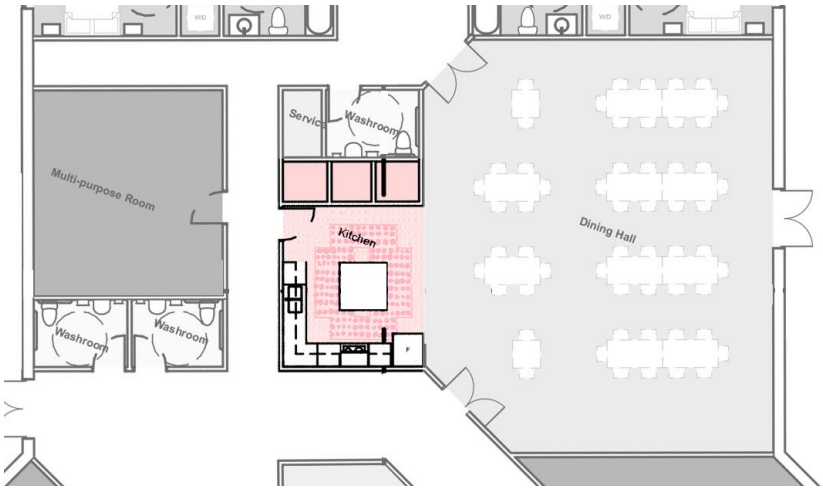


Figure 74: Second Iteration of Kitchen Plan

The third iteration of the kitchen (figure 75) kept all design elements from the second iteration, and enhanced the idea of sightlines and connections throughout the building. To increase visibility into spaces, windows were added above the lower kitchen cabinets. Additionally, the walls of the kitchen are partial height walls to allow for an acoustic connection while enhancing the experience of the clerestory light from the corridor beyond.

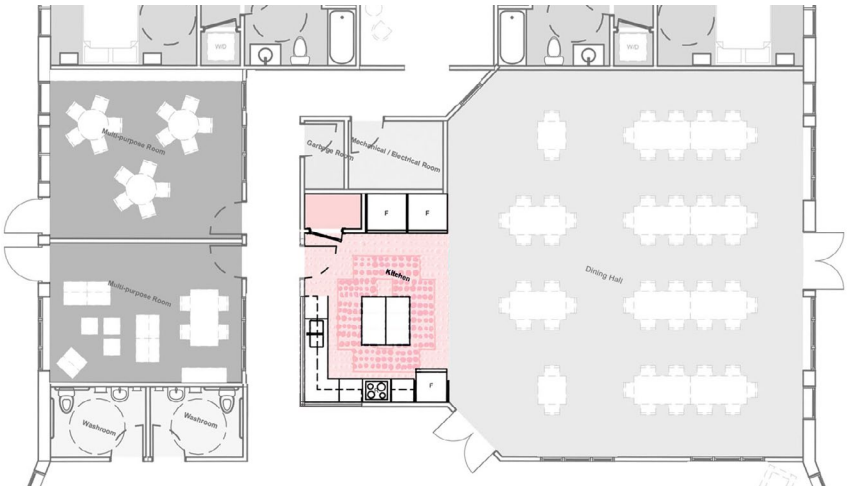


Figure 75: Third Iteration of Kitchen Plan

Across from the kitchen I propose two multi-purpose rooms, one room being for crafts and games and the other room for reading. The dividing wall between the rooms is moveable to accommodate larger functions and gatherings. The idea of the multi-purpose rooms was inspired by the Two Row Wampum teachings, by having something happen simultaneously. The rooms are intended to have the ability to adapt to other purposes such as gatherings but also to provide a space were the residents can gather, socialize, and pass on knowledge and teachings to other people.

Other amenities within the central space (figure 76) include a mechanical and electrical room that services the common spaces and the corridors. Garbage and recycling room, two reading nooks, and two universal washrooms are also part of the design.

Figure 76: Enlarged Floor Plan of Communal Spaces

The housing units offer all the basic amenities, such as a kitchen, dining area and a living room. Each unit is designed to be self-heated by having an appliance[88] installed in a closet along an exterior wall to get direct ventilation outside. This allows the residents to customize their space to their needs. In addition, the units are equipped with a small hot water tank, and a washer and dryer. The units are designed to allow a resident to live in a unit independently if they choose to not participate in the overarching community elements. In the first iteration of the units (figure 77), key design elements were accessibility, and a view of outside as the unit is entered (figure 78), and an inset patio to protect from elements.

88 An example of this product is the condo pack by Napoleaon, the dimensions of the unit are 29 inches wide by 32 inches in length. As mentioned by Napoleon, *Condo Pack*, Napoleon Heating and Cooling, 8, http://condopack.com/docs/brochures/Napoleon-Condo-Pack-Brochure.pdf.

Figure 77: First Iteration of Unit Design


Figure 78: Collage of Two Bedroom Unit

This iteration contained basic design elements in all aspects of the design. The ceilings are dropped in the bathrooms and bedrooms to create a more inviting space (figure 79 and figure 80). In addition, bulkheads are used to vent the bathroom and the stove in the kitchen. The units are made smaller to encourage use of the common spaces. The one bedroom unit is 525 square feet, the two bedroom unit is 745 square feet, and the three bedroom unit is 1060 square feet. The 1:50 study model highlighted the need for additional daylight into the central part of the unit (figure 81).

Figure 79: Reflected Ceiling Plan for First Iteration of Unit Design

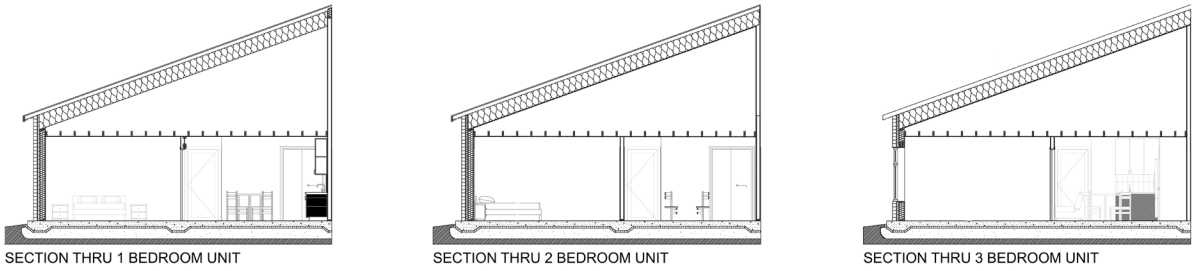


Figure 80: Sections Through First Iteration of Unit Design

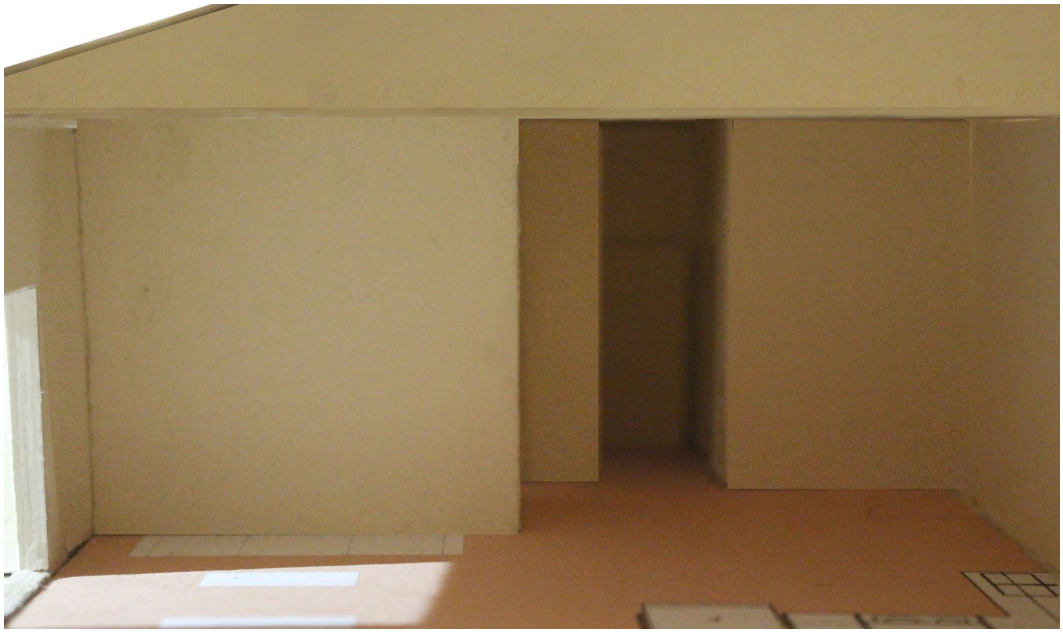


Figure 81: Two Bedroom Sketch Model For Light Testing

The second iteration of the units (figure 82) address the straight exterior walls, insetting the entrances of the units to allow for a more private entrance from the corridor, an inset patio to protect from elements and explore how light can enter the space. The same key design elements as the previous design were considered except this design did not consider the depth of the units and some rooms became oversized.

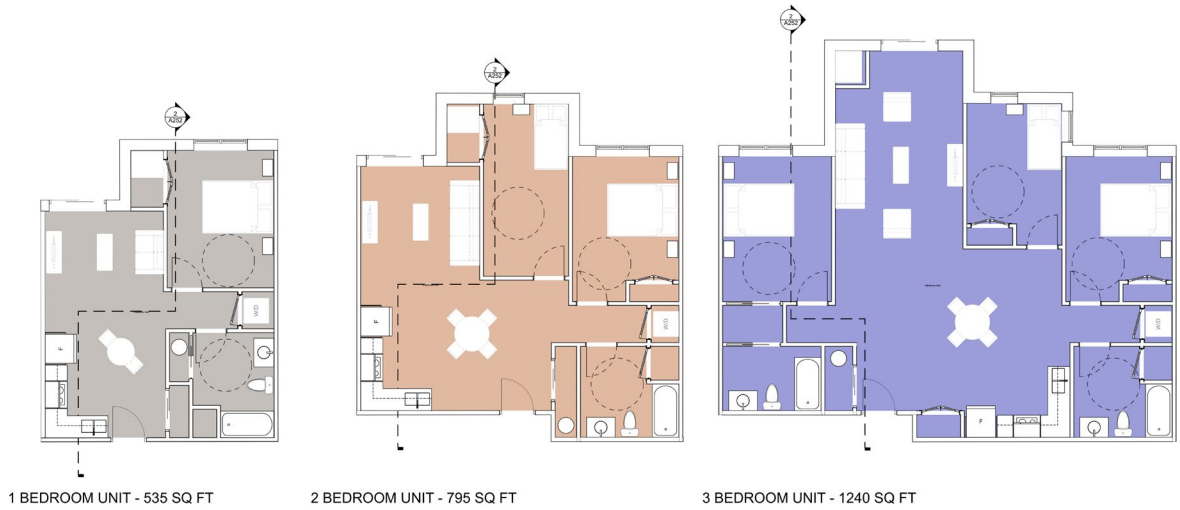


Figure 82: Second Iteration of Unit Design

This iteration contained basic design elements as seen in the previous iteration (figure 83 and figure 84). A clerestory dormer window was added in the kitchen space in the two bedroom and three bedroom units to bring light into the kitchen space (figure 85), which has replaced the traditional fire. A resident may choose to be fully independent and choose not to participate in the community aspect of the design as the units are more spacious now. The one bedroom unit is 535 square feet, the two bedroom unit is 795 square feet, and the three bedroom unit is 1240 square feet.

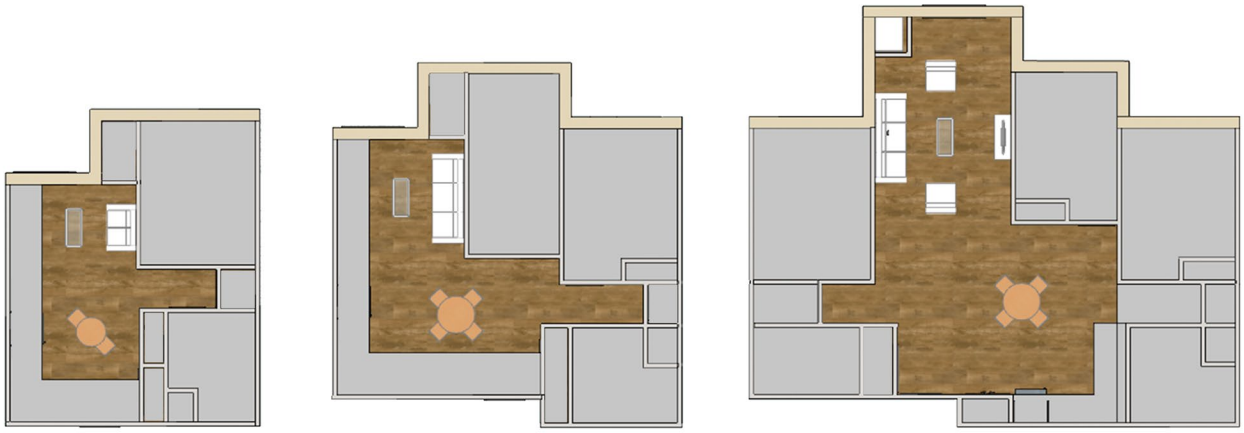


Figure 83: Reflected Ceiling Plan for Second Iteration of Unit Design

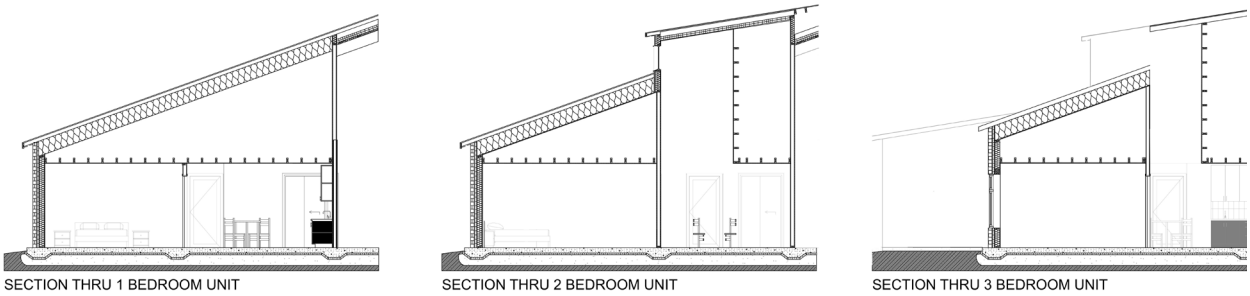


Figure 84: Sections Through Second Iteration of Unit Design

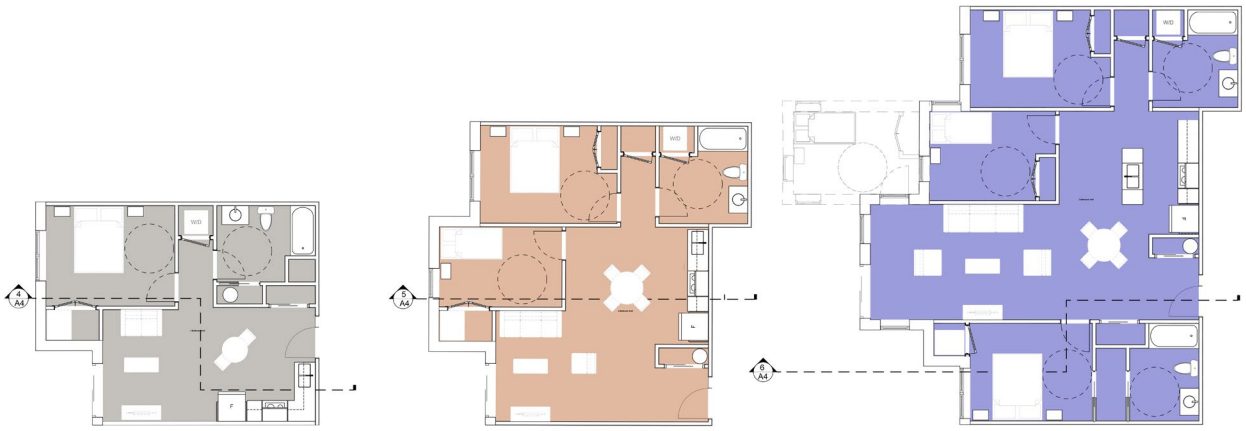


Figure 85: Third Iteration of Unit Design

This iteration broke away from basic design elements seen in the previous iterations in order to be inspired by the wampum belts. However, dropped ceilings are used in the bathrooms and bedrooms to create an inviting space (figure 86). Inspired by the Evergrowing Tree Wampum Belt geometry, the bulkhead in the kitchen was angled (figure 87). The angled bulkhead maximizes the light entering into the space and creates moments for the residents of the two bedroom and three bedroom units to enjoy how the light enters through the clerestory (figure 88).

In addition to maximizing the light entering into the space, it also allows the space to feel more welcoming and not overpowered by the oversized bulkheads. Due to reorganizing the rooms within the units, the width was able to shrink from previous designs. The one bedroom unit is 535 square feet, the two bedroom unit is 750 square feet, and the three bedroom unit is 1150 square feet.

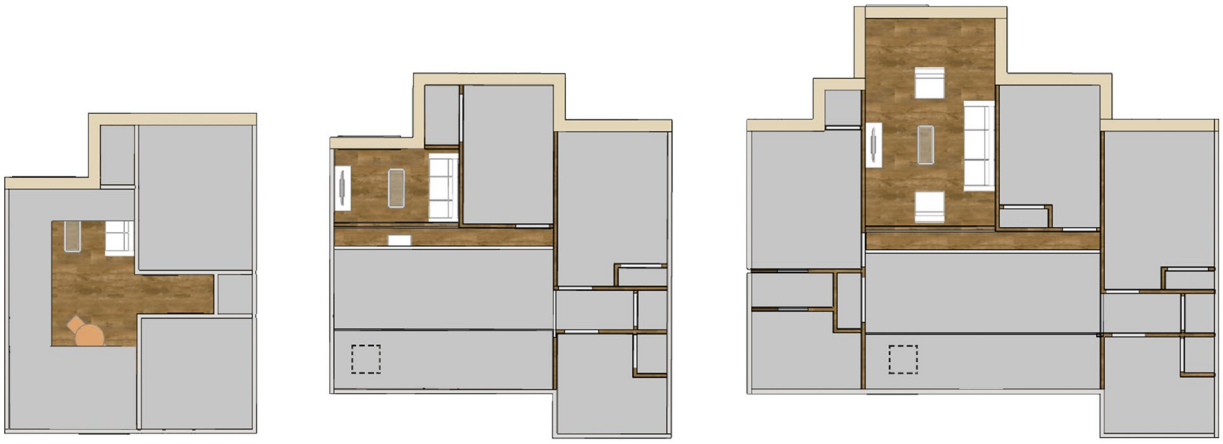


Figure 86: Reflected Ceiling Plan for Third Iteration of Unit Design

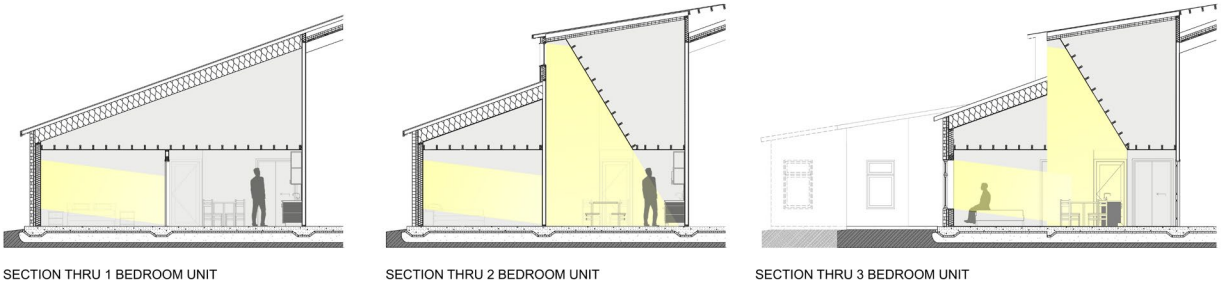


Figure 87: Sections Through Third Iteration of Unit Design

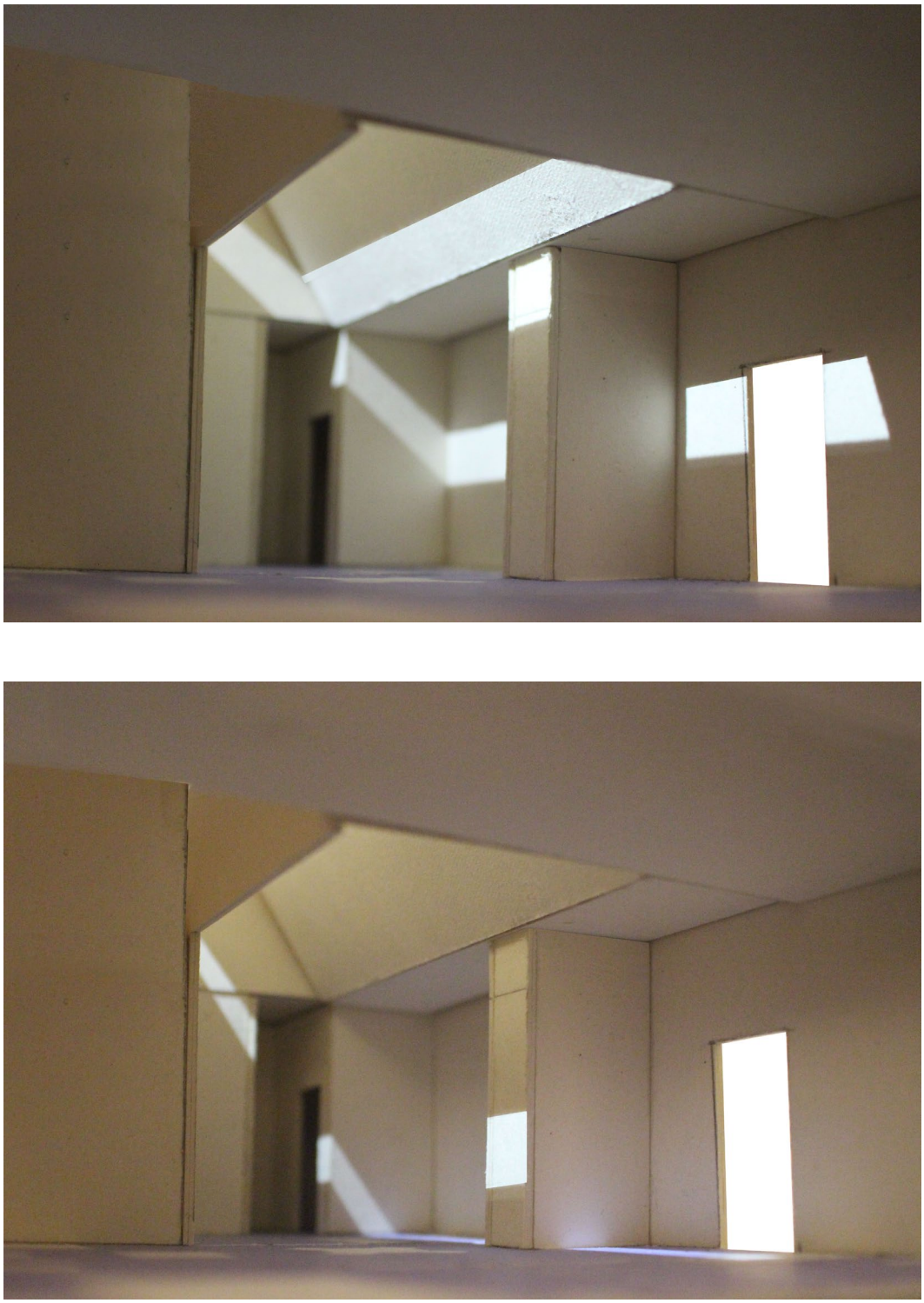


Figure 88: Three Bedroom Sketch Model For Light Testing

The double-loaded corridor began to transform as the units developed (figure 89) by creating narrowed and widened spaces within the corridor. The variation in width provides an opportunity for the units to have an indoor front porch where a resident can sit in front of their unit. Clerestory windows are strategically placed above the unit entrances to allow light to enter from above. The clerestory makes the double-loaded corridor more inviting by having natural light enter the otherwise artificially lit space. This idea was inspired by the longhouse smoke hole and the section reflects the geometry seen in the Evergrowing Tree Wampum Belt.

Figure 89: Collage of First Iteration of Double-Loaded Corridor

The second iteration of the double-loaded corridor (figure 90) refined the variation in corridor width and added a feature ceiling. The intention of the corridor width was to act like an indicator, when the space narrows with no natural light from above, it is meant to force residents to keep walking. Whereas, when the space widens and natural light enters from above (figure 91), it is meant to encourage residents to socialize in the space. The widened space also acts like an indoor front porch where the resident can personalize the space as they wish. For example, some residents may wish to include seating in this space, whereas others may wish to have flowers or paintings (figure 90). The feature ceiling showcases wooden beams and wood decking bringing warmth into the space. To avoid having the feature ceiling overpowered by services, services are proposed to run in the attic space of the units (figure 91).

Figure 90: Collage of Second Iteration of Double-Loaded Corridor

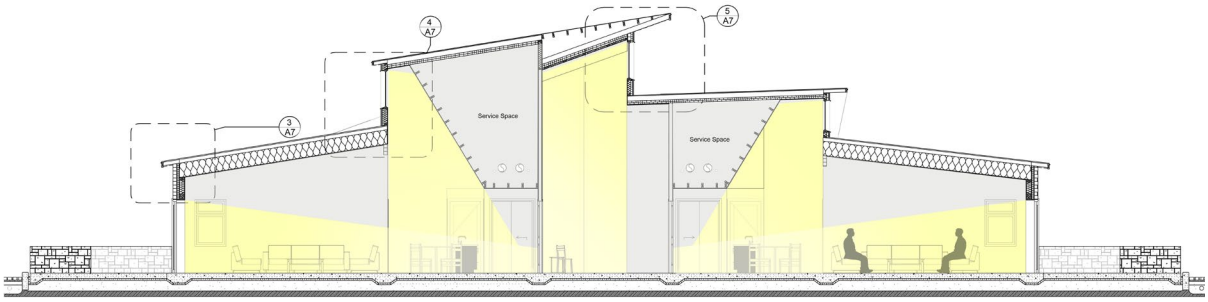


Figure 91: Section Through Double-Loaded Corridor

The third iteration of the double-loaded corridor (figure 92) explored the potential to address the large attic space and bring texture into the corridor space. The upper portions of the corridor walls were inset. As the third iteration developed it became evident the insets in the upper portion of the walls did not enhance the space in any way, in fact, the insets create a ledge which was too high to be used by the residents and would become a place for dust to gather, therefore the inset idea was removed.

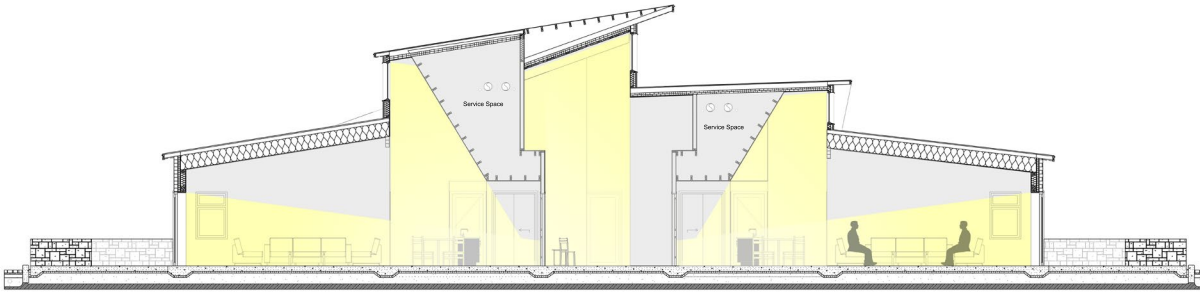


Figure 92: Section Through Double-Loaded Corridor

Since the design returned to the second iteration of the double-loaded corridor, another solution was needed to address the large attic space. Reviewing the unit layouts it became evident the units themselves lacked a large storage space and the attic was wasted space therefore converting the attic space into an inhabitable space, with the service space separated; the large space began to have a purpose. To revise the unit plans, a pull down attic ladder was designed into the ceiling above the unit entry. The attic space has two options for usage, have the attic space as storage for larger or seasonal items (shown on the right in figure 93) or to inhabit the space; for example it can be a children's play area or a reading space (shown on the left in figure 93 and in figure 95).). If the space is an inhabitable space, a window can be added to the angled bulkhead for natural light to enter into the space and to create a view outside (shown on the left in figure 93).

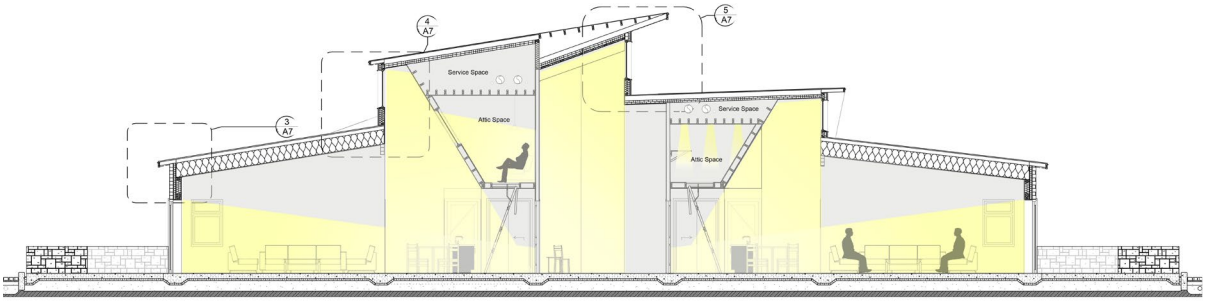


Figure 93: Revised Section Through Double-Loaded Corridor

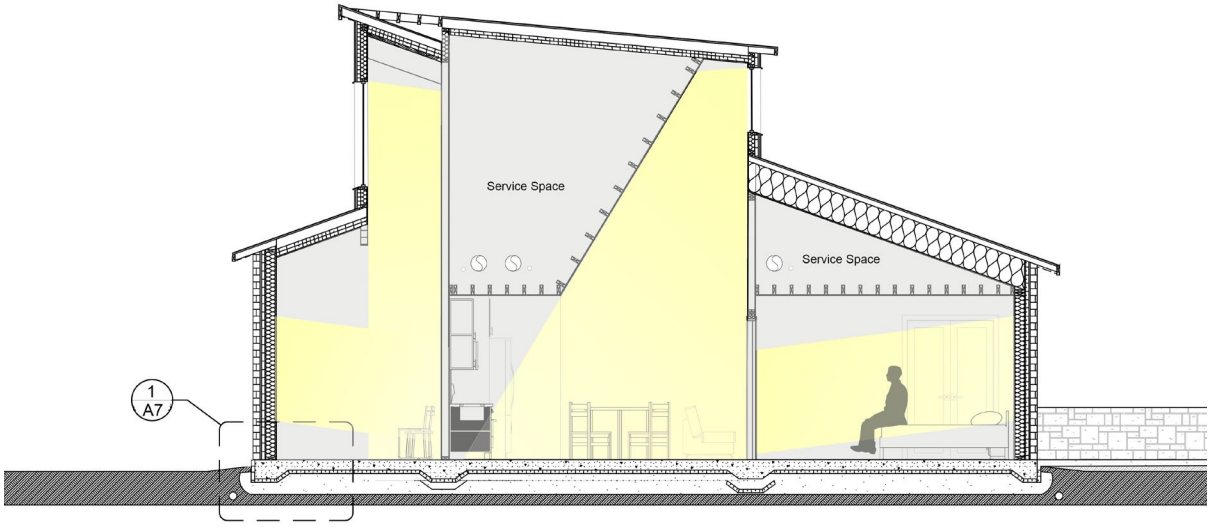


Figure 94: Section Through Single-Loaded Corridor

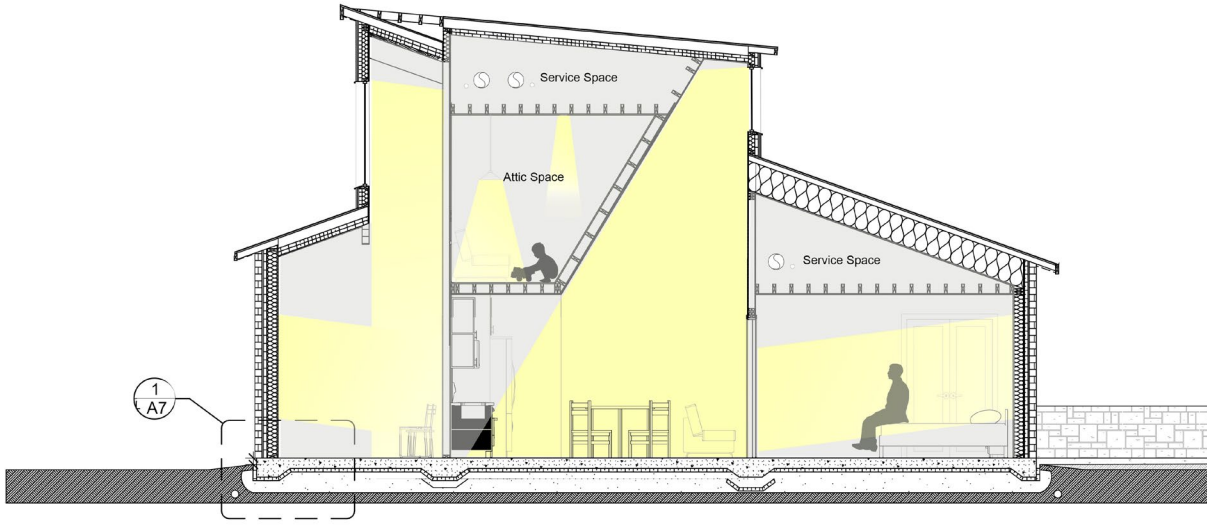


Figure 95: Revised Section Through Single-Loaded Corridor

The first iteration of the single-loaded corridor was very basic, long, narrow and naturally lit from one side. The second iteration began to develop corridor width variations to break the straight edges. During this iteration, the corridor began narrow and widens when there is a unit entry. The idea was to continue the natural lighting from above when there is an entrance into a unit to reflect the design language determined in the double-loaded corridor. Lastly, the third iteration of the single-loaded corridor (figure 96) refined the purpose of the corridor width and started to develop character within the space in section (figure 94). The angled exterior corridor walls became an indicator for the single-loaded corridor as it framed views out into the courtyards as the residents are walking to their units to spark curiosity of what is happening outside. The angled spaces create a small nook if one chooses to stop and look, otherwise traffic is encouraged to keep walking until the corridor widens in front of the unit entry. The feature ceiling is also incorporated into the single-loaded corridor to make a visual connection to the double-loaded corridor.

Figure 96: Collage of Single-Loaded Corridor

7.6 Key Moments of Design

Each space within the building went through several iterations. All iterations are designed with key moments that were thought out. Sometimes the key moments were subtle, other times more obvious to allow all residents to experience the building as they choose.

Corridor width variations create key moments, and occur in the double-loaded corridor, single-loaded corridor, and the facade. These variations break up the long straight corridor, and filter or direct traffic in the space (figure 97 and figure 98). The facade began very flat and straight with little to no appeal, however, after the units went through multiple iterations the facade began to take form having a similar language as the corridors (figure 99).

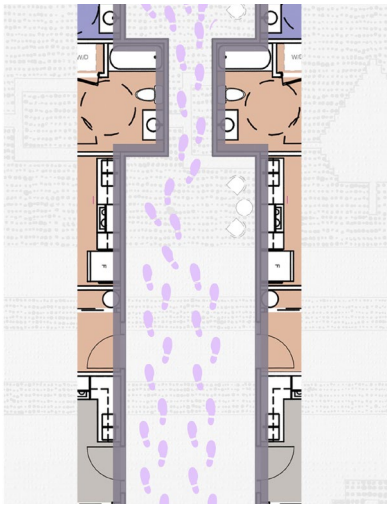


Figure 97: Double-Loaded Corridor Width Showing Circulation

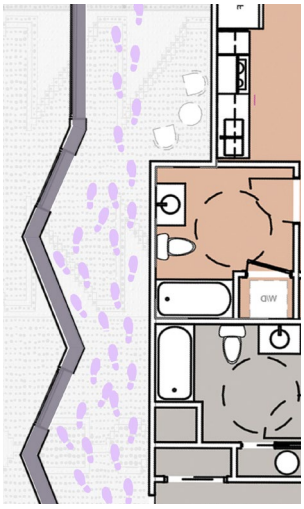


Figure 98: Single-Loaded Corridor Width Showing Circulation

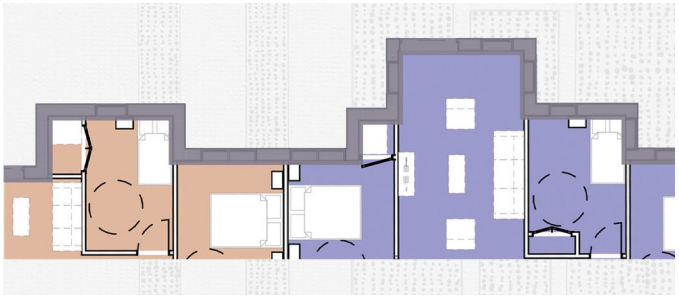


Figure 99: Facade Showing Variations

Glass walls were added at the corridor entrances to mimic the varied corridor widths elsewhere in the design. The glass walls are not intended to become a privacy block, but instead become a threshold by creating a separation and transition from public into private spaces. The glass walls in the single-loaded corridor are an extension of the exterior walls and follow the same angles (figure 100) to define the lobby area. On the public side of the wall a small nook was created proposed as a seating area for all residents to enjoy. The glass in the double-loaded corridor acts as the beginning of the corridor, starting narrow and defining the front porch for the first units of the corridor (figure 101). A resident passes through the threshold as they enter into the corridor spaces intended to be more semi-private.

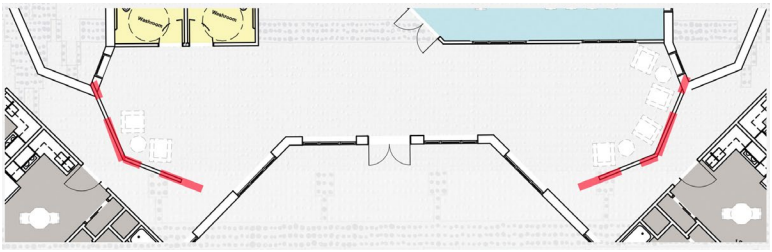


Figure 100: Single-Loaded Corridor Threshold

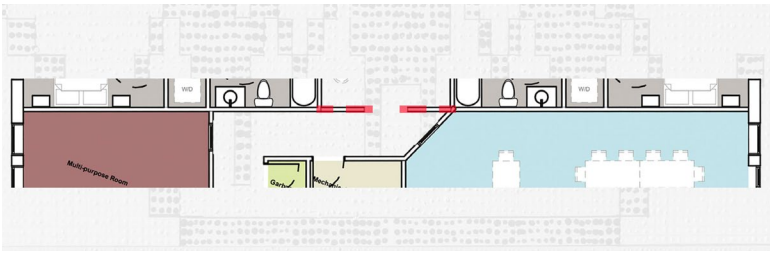


Figure 101: Double-Loaded Corridor Threshold

When designing the spaces it was critical to have sightlines through every space when possible. By creating sightlines through spaces it creates an opportunity to draw a resident's attention and encourage them to participate in activities happening prior to entering into the space. For example, windows were added above the lower cabinets to incorporate sightlines into the kitchen design (figure 102). This design allows for someone entering into the building to see if there is movement in the kitchen or vice versa, someone in the kitchen can see movement in the lobby.

Figure 102: Sightlines in Kitchen Diagram

Sightlines are also used to indicate a transition from public space into private space and vice versa. As a resident is walking to their unit in the double-loaded corridor, if they take a minute to pause and look to either side they can experience views otherwise missed (figure 103). On their right they can see through the dining hall onto the patio and on the left they can see through the multi-purpose room out onto the path leading to the garden/sitting area. If a resident is going from the corridor into the public space and stop, they can see what is happening in the spaces and could be drawn in to join. Additionally, sightlines were also used to emphasize a connection through the central communal spaces to the courtyards (figure 104). By using glass doors, a resident can see directly through and across to the opposite courtyard. This path is also the only connection and exit into the courtyards from the communal spaces.

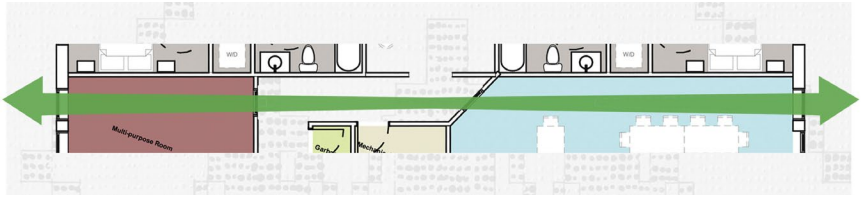


Figure 103: Sightlines Indicating Public to Private Space Transition

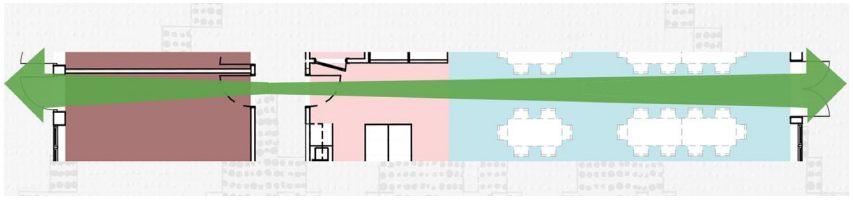


Figure 104: Sightlines Through to Courtyard

The single-loaded corridor was designed to have framed views out towards the courtyards (figure 105). The purpose of the framed views are to allow residents to see out into the courtyard as they walk to their rooms always seeing what activities are happening. The views out also create an area by the window where a resident can stop and enjoy the view while allowing other traffic to pass behind.

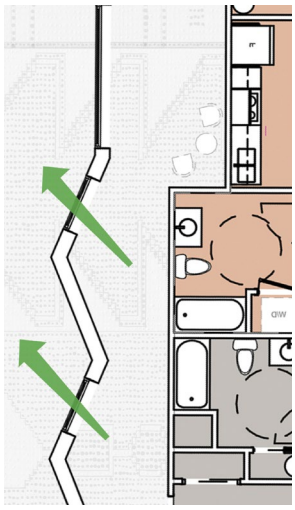


Figure 105: Single-Loaded Corridor Framed Views

The dormers began to allude to the longhouse material, and how the bark functioned. The bark would peel up and create splits, resulting in light entering in (figure 106 and figure 107). The clerestory was a way for light to enter from above, and it also created the peeling up effect in elevation (figure 108)

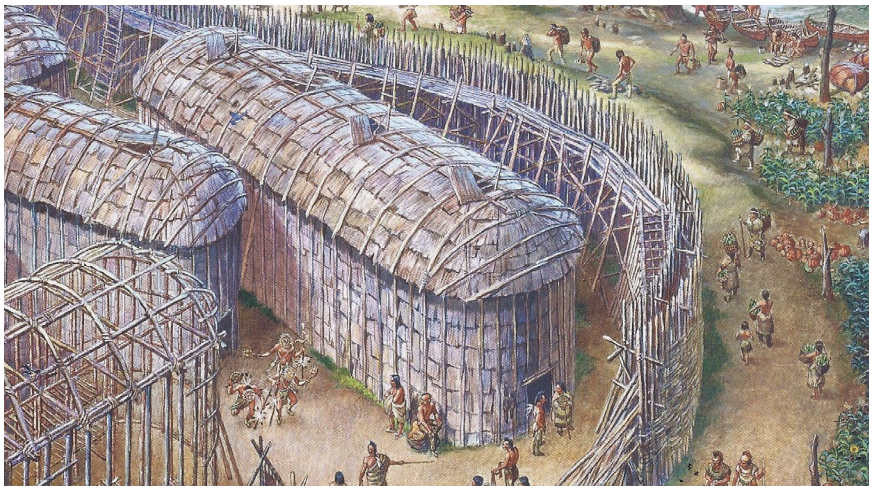


Figure 106: Bobbie Kalman, *A Longhouse Village,* in *Life in a Longhouse Village* (St. Catharines, ON : Crabtree Publishing Company, 2001), 6.

Figure 107: Randy Hobson. *Iroquois Longhouse in HDR*. Digital Image. *Canadian Geographic Photo Club*. November 13, 2012. https://photoclub.canadiangeographic.ca/mediadetail/8538149?offset=0&groupId=16035.

Figure 108: Building Elevations

Within the community of Six Nations there are skills taught within local schools along with multiple companies who specialize in construction or building services. Skills taught in school are carpentry, plumbing, electrical, and welding (figure 109).[89] There are also local businesses who deal with heating and cooling, construction, engineering, landscaping, a utility company who supplies natural gas, and lastly water haulage[90] (figure 110).

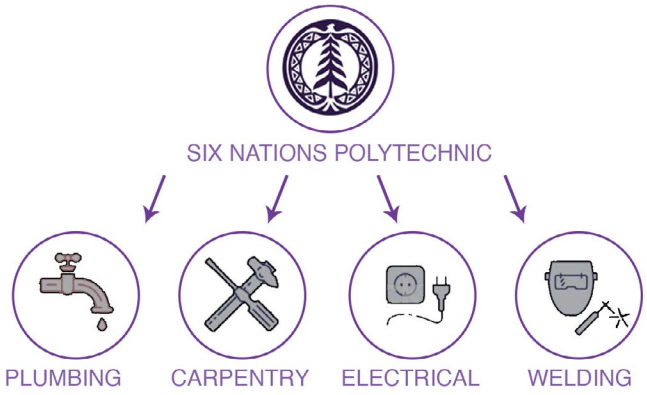


Figure 109: Diagram of Skills Taught in Local Schools

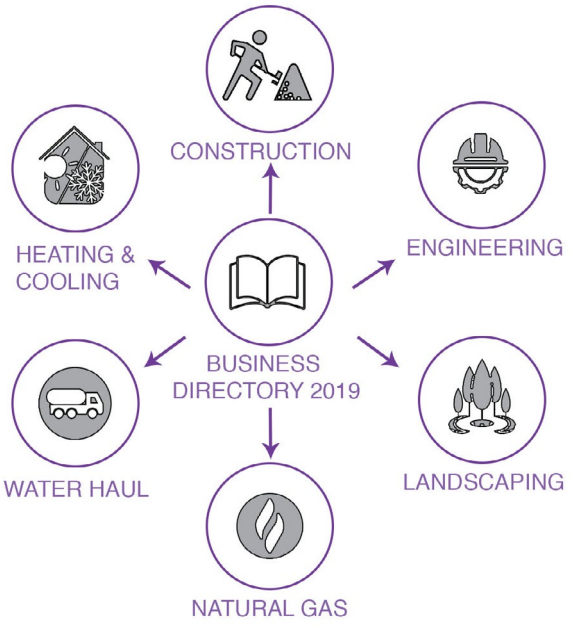


Figure 110: Diagram of Local Businesses 2019

89 Six Nations Polytechnic, *Trades Fundamentals*, Six Nations Polytechnic, https://www.snpolytechnic.com/program/trades-fundamentals.

90 Six Nations of the Grand River/ Mississaugas of the Credit First Nation, *Business Directory 2019*, 23rd ed. (Ohsweken, ON: Two Rivers Community Development Centre, 2019), 10-18.

Through discovering the local skills and businesses it became evident that the proposed building construction could support the local knowledge. Details were determined to show the structure may appear to be complex, however conventional construction could be used. The foundation is proposed to be slab on grade (figure 111). Permeable pavers are proposed for pathways to help manage water on-site (figure 112). Standard wall construction is typical throughout, and the roof also uses a variety of conventional methods, including pre-engineered trusses and LVL beams (figure 113, figure 114, and figure 115).

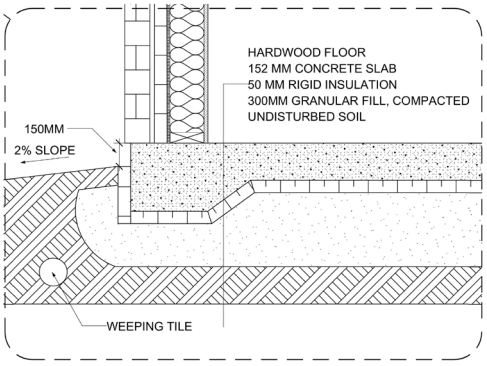


Figure 111: Foundation Section Detail

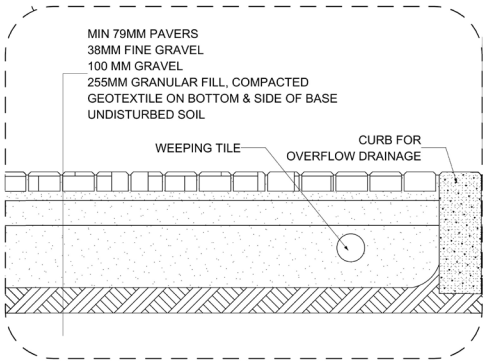


Figure 112: Permeable Paver Section Detail

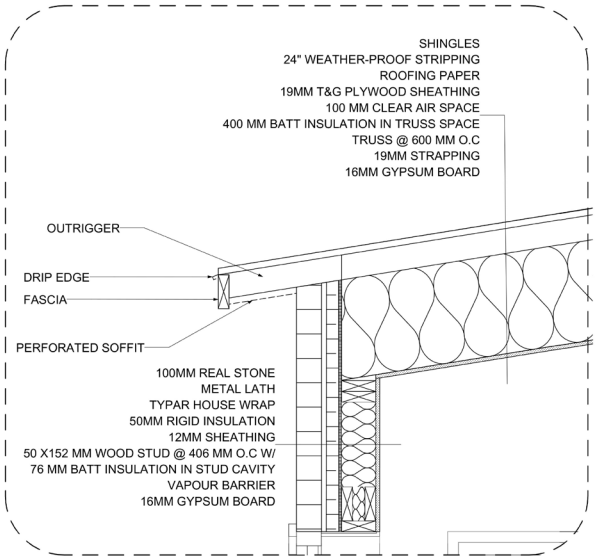


Figure 113: Wall to Roof Connection Detail

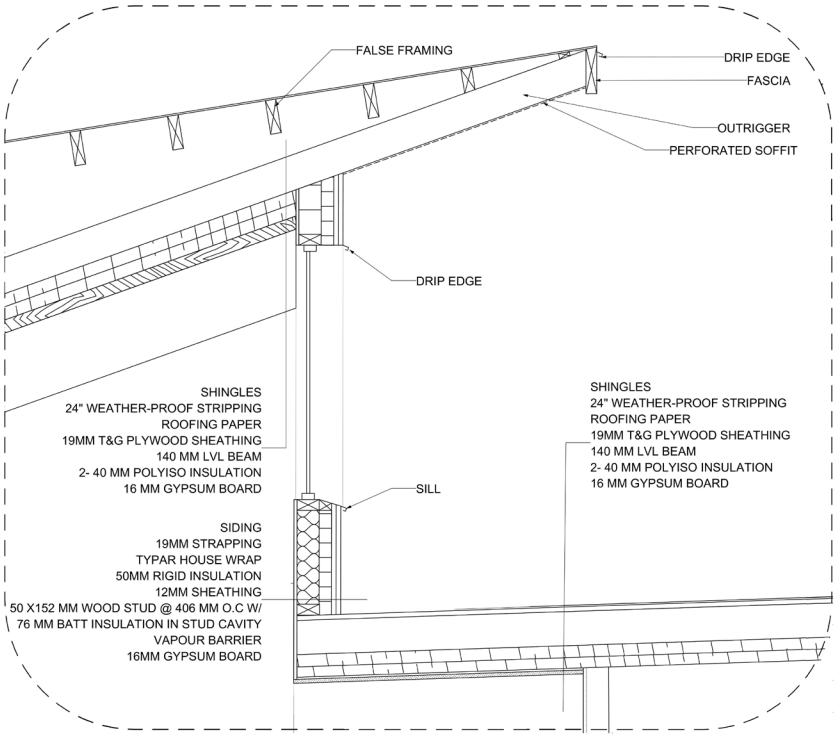


Figure 114: Double-Loaded Corridor Clerestory Connection Detail

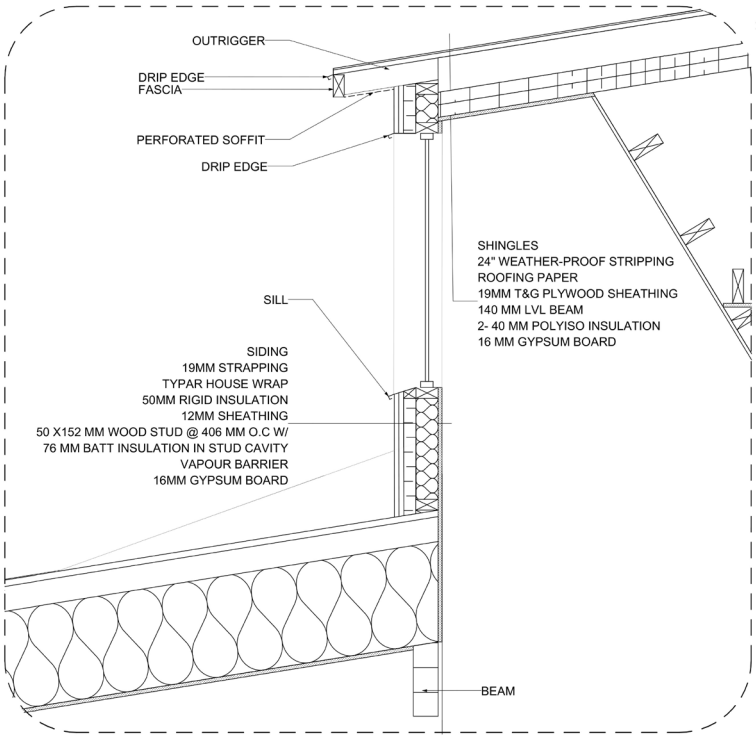


Figure 115: Clerestory Dormer Connection Detail

Chapter 8

8 Conclusion

The research question was how can the culture of the Haudenosaunee be reflected within their built environment to align with the needs of the community? To address this question, community engagement, wampum belts, and the Haudenosaunee longhouse were studied to understand how the culture of the Haudenosaunee people can be reflected within their built environment while addressing the needs within the community.

Initial ideas changed when community engagement created challenges unresolvable within the scope of the thesis. Instead of inventing a process to execute the hypothetical project, community engagement was explored to understand what made engagement valuable to incorporate into the design process and how the outcome was affected. The more the community shared, the more the design was able to incorporate their visions and in the end the success of the design depended on the community engagement techniques used during the process. The intent was to understand the community and their wants and needs to explore what makes community engagement successful and what makes community engagement fail. Next, case studies were completed on Haudenosaunee architects, Brian Porter and Chris Cornelius, who successfully include Indigenous precedents into their designs. Both architects avoid duplicating their inspiration and instead focus on a conceptual understanding of Indigenous principles, and how these function today in the 21st century. Inspired by Porter and Cornelius, community engagement began a way to explore Haudenosaunee culture, specifically, wampum belts and the longhouse and how concepts can be brought forward to influence a design in the 21st century.

Through research it was discovered wampum belts were made with good intentions and used to narrate the history of the Haudenosaunee. Wampum belts referred to unity, equality, harmony, friendship and storytelling. With understanding a brief history of wampum belts, they began to heavily influence the design in plan with specific room layouts and shapes. However, after many iterations and further review, spaces were influenced by the meaning of the wampum belts instead of creating spaces to look like the belt of inspiration. The sections of the building

were influenced by the wampum belt geometry. In the end, the design began to focus on what the belts represented and meant instead of informing the direct space and the layout of the space.

The Haudenosaunee traditionally lived within longhouses and longhouse villages. Through research it was discovered, whether the members were blood related relatives, clan members or village members they valued one another, everyone worked together to maintain the village and support one another. The structure of the longhouse itself was an adaptable structure that expanded to accommodate the growth of a family. Applying research into design, the longhouse and longhouse village influenced the design from early stages when determining the program for the design. From that point forward the longhouse became an important aspect influencing every stage of the design. Interior and exterior program was designed to create spaces where residents are able to respect and support one another in a similar way to how the longhouse and longhouse village functioned. Interior programming includes a communal kitchen and dining hall where knowledge can be passed on to others while being able to prepare and share a food. Multi-purpose rooms create spaces for teachings to be shared, a place for activities such as games, crafts, and even a place to sit and read while being surrounded by other people. Many spaces considered how light can enter into a space. Clerestories were used above places where socialization was intended to happen. Specifically, in the double-loaded corridor where the corridor widens for the entry into the units light enters in from above. Another example of the light entering in from above is in the two and three bedroom units, the kitchen in the 21st century has replaced the communal fire from the 17th century, therefore this clerestory echoes the smoke hole from the longhouse. The importance of being able to expand to accommodate growth, was incorporated into the design on a macro-scale, by designing the building to expand also on the micro-scale, by designing the three bedroom unit to be able to expand by adding an extra room.

Exterior program include places for knowledge to be shared and skills to be taught. The pond is a place to relax, socialize, a place to fish during the summer and a place to skate in the winter. The skinning area was designed to allow hunting teachings to be encouraged along with sharing game amongst people. A communal fire was included for a place to gather and socialize, a place where game can be smoked. Prior to entering the building, residents are greeted by a vegetable

garden. The vegetable garden is a place to allow the residents to work together to grow food and encourage equal sharing between everyone. Other courtyards provide a space designed for different ages groups to enforce the notion that the building is multi-generational. One courtyard is a seating area surrounded by gardens and another is an elongated playground for younger residents providing a designated safe area to run, slide, climb and swing.

To conclude, through the scope of this thesis, community engagement, wampum belts, and the Haudenosaunee longhouse were explored to demonstrate how the culture of the Haudenosaunee can be reflected within their built environment to align with the needs of the community.

Bibliography

Anderson, Kim. *Ten GREAT Years of Opening Doors to Our People*. Grand River Employment and Training. http://www.greatsn.com/pdf/GREATfinalweb.pdf.

Burdett-Moulton, Harriet. *Community Engagement*. Interviewed by author. November 8, 2018.

Bastedo, Jake. *Inquiry for Six Nations*. Interviewed by author. October 24, 2018.

Butler, Kristin. "Chris Cornelius Translates Culture in to Contemporary Architectural Design," *Indian Country Today*, February 3, 2017, https://newsmaven.io/indiancountrytoday/archive/chris-cornelius-translates-culture-in-to-contemporary-architectural-design-X4MoqSWpVky87fY5zsquQg/.

Cornerstone, Architecture. *The Collaborative Design Manifesto*. London, ON: Cornerstone Architecture Incorporated, 2013.

"Definition of Community Engagement," Libor Definition from *Financial Times Lexicon*, http://lexicon.ft.com/Term?term=community-engagement.

Ellis, Chris. *Community Engagement*. Interviewed by author. October 29, 2018.

Haudenosaunee Confederacy. *Wampum*. Haudenosaunee Confederacy. https://www.haudenosauneeconfederacy.com/wampum/.

Hertzberg, Hazel W. *The Great Tree and the Longhouse: The Culture of the Iroquois*. New York, NY: Macmillan Company, 1966.

Hill, Susan M. *The Clay We Are Made Of: Haudenosaunee Land Tenure on the Grand River*. Winnipeg. Manitoba: University of Manitoba Press, 2017.

Hobson, Randy. "Iroquois Longhouse in HDR." *Canadian Geographic Photo Club*. November 13, 2012. https://photoclub.canadiangeographic.ca/mediadetail/8538149.

Hoffmann, Torsten. *SunCalc Sun Position*. SunCalc. https://www.suncalc.org/#/43.0634,-80.1014,18/2019.06.21/22:22/1/1.

Isaacs, Steve. *G.R.E.A.T Centre Project-Site Visit*. Interview by Haley Schumacher and Melissa Snodgrass. October 14, 2015.

Jennings, Francis, William N. Fenton, Mary A. Druke, and David R. Miller. *The History and Culture of Iroquois Diplomacy: An Interdisciplinary Guide to the Treaties of the Six Nations and Their League*. Syracuse, NY:Syracuse University Press, 1985.

Kalman , Bobbie. *Life in a Longhouse Village*. St. Catharines, ON: Crabtree Publishing, 2001.

Kiddle, Rebecca, Luugigyoo Patrick Stewart, and Kevin OBrien. *Our Voices: Indigeneity and Architecture*. Novato, CA: ORO Editions, 2018.

Martin, Lisa. *Haudenosaunee Teachings*. Taught to Haley Schumacher. Prior to November 2006.

Messner, Matthew. "studio:indigenous Wants to Design Architecture Rooted in Native American Worldviews," *The Architects Newspaper*, January 16, 2017, https://archpaper.com/2017/01/studio-indigenous-profile/.

Muller, Kathryn V. "The Two "Mystery" Belts of Grand River: A Biography of the Two Row Wampum and the Friendship Belt." *American Indian Quarterly* 31, no. 1 (2007): 129-164. http://www.jstor.org/stable/4138898.

Museum of Ontario Archaeology. *Wampum*, Museum of Ontario Archaeology, January 23, 2015, http://archaeologymuseum.ca/wampum/.

Nabokov, Peter and Robert Easton. *Native American Architecture*. New York, New York: Oxford University Press, 1989.

Napoleon. *Condo Pack*. Napoleon Heating and Cooling. http://condopack.com/docs/brochures/Napoleon-Condo-Pack-Brochure.pdf.

Nation, Onondaga. "Dust Fan Belt." *Onondaga Nation People of the Hills*. https://www.onondaganation.org/culture/wampum/dust-fan-belt/.

National Museum of the American Indian Education Office. *Haudenosaunee Guide for Educators*. Washington, D.C: National Museum of the American Indian, 2009, https://americanindian.si.edu/sites/1/files/pdf/education/HaudenosauneeGuide.pdf

Polytechnic , Six Nations. "Photo of the Indigenous Knowledge Guardian Belt" in *Speak Mohawk*, Six Nations Polytechnic, ON: Thornton Media Inc, 2017.

Porter, Brian. *G.R.E.A.T Centre Project*. Interviewed by Haley Schumacher and Melissa Snodgrass. October 14, 2015.

Richter, Daniel K. *The Ordeal of the Longhouse: The Peoples of the Iroquois League in the Era of European Colonization*. Chapel Hill: University of North Carolina Press, 1992.

Rust, Eleanor. *Wiikiaami*, Exhibit Columbus, https://exhibitcolumbus.org/exhibition/wiikiaami.

Six Nations Community Planning. *Six Nations Community Plan: 2018 Progress Update*. Six Nations of the Grand River Development Corporation, August 2018, http://sndevcorp.ca/wp-content/uploads/2018/08/Six-Nations-Community-Plan-2018-Progress-Update.pdf.

Six Nations Council. *Six Miles Deep: Land Rights of the Six Nations of the Grand River*. Ohsweken, ON: Six Nations Council, 2015, http://www.sixnations.ca/SixMilesDeepBooklet2015Final.pdf.

Six Nations Lands/Membership Department. *Community Profile- Population*. Six Nations of the Grand River. http://www.sixnations.ca/CommunityProfile.htm.

Six Nations of the Grand River Development Corporation. *Six Nations Community Plan*. Six Nations of the Grand River Development Corporation, http://sndevcorp.ca/about-community-plan/.

Six Nations of the Grand River Development Corporation. *This Is What We Heard*. Six Nations of the Grand River Development Corporation, http://sndevcorp.ca/this-is-what-we-heard/.

Six Nations of the Grand River/ Mississaugas of the Credit First Nation. *Business Directory 2019*. 23rd ed. Ohsweken, ON: Two Rivers Community Development Centre, 2019.

Six Nations Polytechnic. *Trades Fundamentals*. Six Nations Polytechnic. https://www.snpolytechnic.com/program/trades-fundamentals.

Smoke, Eladia. *Community Engagement*. Interviewed by author. October 19, 2018.

studio:indigenous. *About*. studio:indigenous, https://www.studioindigenous.com/about/.

studio:indigenous. *Wiikiaami Film*. studio:indigenous, https://www.studioindigenous.com/wiikiaami_film/.

Windfinder.com. *Wind Statistic Brantford Airport.* Windfinder. https://www.windfinder.com/windstatistics/brantford-municipal-airport.

Woodland Cultural Centre. Text, Historical Gallery, *Wampum and Wampum Belts*, Woodland Cultural Centre, Brantford, Ontario.